

BEFORE THE  
POSTAL REGULATORY COMMISSION  
WASHINGTON, D.C. 20268-0001

STATUTORY REVIEW OF THE SYSTEM )  
FOR REGULATING RATES AND CLASSES ) Docket No. RM2017-3  
FOR MARKET DOMINANT PRODUCTS )

**DECLARATION OF TIMOTHY J. BRENNAN  
FOR THE PUBLIC REPRESENTATIVE**

(MARCH 20, 2017)

**I. INTRODUCTORY MATERIAL**

My name is Timothy J. Brennan. I am Professor of Public Policy and Economics in the School of Public Policy at the University of Maryland, Baltimore County (UMBC), where I have been teaching since 1990. In January 2017, the Public Representative of the Postal Regulatory Commission (“PRC” or “the Commission”) contracted with me to prepare this Declaration “regarding the process and structure of the review, as well as whether the current system is achieving the objectives, while taking into account the factors, and if not, whether and what modifications to the system or an alternative system should be adopted as necessary to achieve the objectives,” as requested in the PRC’s Order No. 3673 in this docket (Ordering Paragraph 2). The main focus of this Declaration will be on the need to adjust the price cap-based “modern system of regulation” of rates for market dominant products in the Postal Accountability and Enhancement Act (PAEA).<sup>1</sup> I will explain below why rates should be adjusted not only for unusual exi-

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<sup>1</sup> H.R. 6407, P.L. 109-435 (2006).

gencies,<sup>2</sup> but also to maintain the financial stability of the United States Postal Service (USPS), Objective 5 in PRC Order No. 3673. I will also propose a method for making such adjustments.

Much of my research and professional work has been what economists call “industrial organization”, including regulatory economics and antitrust policy. I have published over 90 articles and 40 chapters in professional journals and books.<sup>3</sup> From 2013 through 2016, I co-organized with the late Michael Crew annual international conferences on postal delivery and economics and co-edited four books of papers from those conferences. Most relevant for this Declaration are one of the earliest academic articles on the advantages and disadvantages of price cap regulation (PCR), and a chapter from one of the books proposing an automatic adjustment under the price cap mechanism to prices for USPS market dominant products and services in the face of declining demand largely due to the incursion of electronic communication (hereafter cited as Brennan and Crew, 2016).<sup>4</sup>

My professional activity has not been exclusively academic. The first eight years of my career were spent on the economic staff of the U.S. Department of Justice’s Antitrust Division, where I focused on regulatory reform in telecommunications and transportation. Since 1995, I have been a Senior Fellow at Resources for the Future, an independent non-profit research organization looking at environmental, energy, and natural resource issues.<sup>5</sup> In 1996-97, I was the

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<sup>2</sup> 39 U.S.C. §3622(d)(1)(E) [“rates may be adjusted on an expedited basis due to either extraordinary or exceptional circumstances”].

<sup>3</sup> My curriculum vitae is attached as Exhibit 1 to this Declaration.

<sup>4</sup> Brennan, T., “Regulating by ‘Capping’ Prices,” *Journal of Regulatory Economics* 1 (1989): 133-47; Brennan, T. and M. Crew, “Price Cap Regulation and Declining Demand,” Crew, M. and T. Brennan (eds.), *The Future of the Postal Sector in a Digital World* (New York: Springer, 2016): 1-17.

<sup>5</sup> The opinions expressed here are not those of Resources for the Future (RFF), which does not take position or provide consulting services, and not necessarily those of anyone on its staff. My work at RFF has mostly involved electricity market design and energy conservation policies.

senior economist for industrial organization and regulation on the staff of the White House Council of Economic Advisors. During 2003-05, I was a staff consultant to the Director of the Bureau of Economics at the Federal Trade Commission, and I held the T.D. MacDonald Chair in Industrial Economics at the Canadian Competition Bureau in 2006. Most recently, I spent 2014 as Chief Economist at the Federal Communications Commission.

The remainder of this Declaration proceeds as follows. Section II reviews the rationale for PCR, followed by a brief description of some of the potential shortcomings of PCR, both in general and related to USPS.<sup>6</sup> It is important to recognize that some of the financial difficulties faced by USPS are not due necessarily to PCR *per se*, but due to additional constraints on the ability of USPS to borrow<sup>7</sup> and requirements that USPS prefund retiree health benefits.<sup>8</sup> The shortcoming of PCR relevant to this Declaration is the consequence to a regulated firm, here USPS, of a decline in demand for its products and services; Section III discusses this issue in the context of market dominant USPS services. Section IV contains the core of this Declaration, the proposal for the Commission to add an adjustment mechanism for declining demand to the PAEA-PCR formula. The proposed mechanism is designed to be relatively simple, based only on estimates (overall or for a specific class or category of service) of (a) the percentage demand has

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<sup>6</sup> Some of these shortcomings, particularly those that affect service quality, will be covered in more detail in a Declaration filed on behalf of the Public Representative in this docket from Prof. John Kwoka of Northeastern University.

<sup>7</sup> 39 U.S.C. § 2005(a)(2)(C); U.S. General Accounting Office, “U.S. Postal Service: Action Needed to Address Unfunded Benefit Liabilities: Statement of Frank Todisco, Chief Actuary Applied Research and Methods,” Testimony before the Subcommittee on Federal Workforce, U.S. Postal Service and the Census, Committee on Oversight and Government Reform, House of Representatives (March 13, 2014). The \$15 billion statutory limit has not been adjusted since 1992.

<sup>8</sup> PAEA, H.R. 6407 (2006). Title VII, “Postal Civil Service Retirement and Health Benefits Funding Amendments of 2006”. The annual amount USPS is obligated to raise to meet this requirement is “averaging roughly \$5.6 billion during the 10 years 2007-2016, with any remaining unfunded liability to be paid over 40 years starting in 2017.” Schulyer, M., “A Primer on the Postal Service Retiree Health Benefits Fund” Fiscal Fact No. 524, (Washington: Tax Foundation: August 2006).

fallen, (b) the ratio of fixed to variable costs and (c) the price elasticity of demand. Section V concludes with a discussion of implementation issues associated with such an adjustment mechanism.

## II. PRICE CAP REGULATION: RATIONALES AND POTENTIAL SHORTCOMINGS

### A. RATIONALES

If price caps are, as expressed in the PAEA, the “modern system of regulation,” one can say that they arose in part because of dissatisfaction with what might be called the “traditional system of regulation,” known as “cost of service” (COSR) or “rate of return” regulation. Under COSR, the goal of regulation is to set prices equal to the average unit cost of providing the regulated service, where that cost includes a “just and reasonable return” on the capital invested to provide the service.<sup>9</sup> An initially identified shortcoming of COSR was that if regulators erred and allowed the regulated firm to earn a rate of return exceeding its cost of capital, it would have incentives to use too much capital to provide the regulated service.<sup>10</sup>

Price cap regulation arose, because and counterintuitively, COSR has an even worse problem if regulators get the rate of return right. If so, the regulated firm just covers its costs regardless of whether it is efficient or wasteful, or whether it provides high or low quality of service. Consequently, the firm has no incentive on its own to control the costs of providing its

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<sup>9</sup> *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591, 603 (1944) [“From the investor or company point of view, it is important that there be enough revenue not only for operating expenses, but also for the capital costs of the business. These include service on the debt and dividends on the stock.”] COSR is also called rate-of-return regulation because these capital costs are essentially the undepreciated rate base times rate of return, adjusted for risk, which investors could have earned had they invested elsewhere. Unlike operating costs, taxes, and depreciation, this opportunity cost is not directly observed, and hence the primary source of disputes regarding regulated prices in COSR is primarily what the rate of return should be.

<sup>10</sup> Averch, H. and L. Johnson, “Behavior of the Firm under Regulatory Constraint,” *American Economic Review* 52 (1962): 1052-1069.

regulated services. To do COSR and ensure that the regulated firm produces efficiently, regulators have to take on the complex and contentious task of evaluating and approving in advance (or second-guessing after the fact) the regulated firm's capital and operating decisions.

The key feature distinguishing PCR from COSR is that the goal of COSR is to connect prices to costs, while PCR radically separates prices from costs.<sup>11</sup> By having the regulated firm take the regulated price as given rather than as something that moves up or down as its costs move up or down, PCR transforms the regulated firm into essentially a competitive firm, where the economists' definition of competition is "take price as given" and not something that can be determined by the regulated firm's decisions. Crucially, under PCR, if a firm is able to cut costs, like a competitive firm, it will keep the money. This restores the incentive to control costs that traditional regulation takes away, without the need for regulatory oversight over costs.<sup>12</sup>

Under PCR, the regulator allows prices to move over time, but not in a way based upon the firm's actual costs. PCR is often referred to as "CPI – X" regulation.<sup>13</sup> The first terms the idea that the PCR is allowed to go up by the rate of inflation.<sup>14</sup> (To ensure that the regulated firm is able to cover costs at the start, the initial price may be based on COSR or inherited from prior use of COSR if PCR is replacing it.) The purpose of this CPI adjustment is to keep the regulated

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<sup>11</sup> Brennan (1989), *supra* n. 4.

<sup>12</sup> PCR also eliminates the incentive to cross-subsidize competitive services by charging their attributable costs to the regulated services. If regulated services prices are independent of cost attributions, the regulated firm gains nothing by misallocating costs. Brennan (1989), *supra* n. 4; Brennan, T., "Cross-Subsidization and Cost Misallocation by Regulated Monopolists," *Journal of Regulatory Economics* 2 (1990): 37-51. The extent of cross-subsidization by USPS of its competitive services and potential remedies are outside the scope of this Declaration.

<sup>13</sup> Prof. Kwoka's declaration described PCR as "CPI – X + Y + Z", where "Y" refers to other regulatory pass-through costs and "Z" refers to other exogenous cost shifts. I do not discuss those last two terms here. I mention it because below I use "Z" to refer to the percentage by which demand fell, which is different from how Prof. Kwoka uses "Z". I use Z largely because that was the notation Prof. Michael Crew and I used in Brennan and Crew (2016), *supra* n. 4, and I want to be consistent with that.

<sup>14</sup> Strictly speaking, "CPI" here refers not to the CPI, but to the ratio of the CPI in a given year to the CPI in the previous year, that is,  $1 + \text{the rate of inflation}$ .

firm from becoming insolvent just because its price has not kept up with inflation. Under the PAEA, the price index used is the CPI for urban consumers, known as “CPI-U”.<sup>15</sup>

The “X” term refers to a percentage reduction in prices each year. This factor, also known as a “productivity factor”, is the portion of the expected costs savings that would be returned to ratepayers every year. Because the primary rationale for PCR is to give the firm an incentive for cost savings, the X term reflects a politically determined division of those expected gains between the firm and its ratepayers. This term is not based on actual cost savings—if it were, we would be back to COSR—but on the forecast of cost savings. If the regulated firm reduces costs by more than X percent after inflation, it gets higher profits; if not, its profits are lower. In general, to avoid prescribing annual PCR reductions that would be greater than the regulated firm’s expected productivity, X would be no greater than the expected level of cost reductions the firm would be expected to achieve. Under PAEA, the X factor is implicitly zero,<sup>16</sup> indicating either that USPS was not expected to reduce costs very much under PAEA or that the preference of Congress was that the returns go to USPS, perhaps to meet the aforementioned health retiree funding obligations.

## B. POTENTIAL SHORTCOMINGS

PCR improves on traditional regulation by giving the regulated firm an incentive to control costs, divides those returns between the regulated firm and its customers, and simplifies regulation by eliminating the need to oversee the firm’s decisions. However, it is not without some shortcomings, both in general and with respect to its application to USPS.

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<sup>15</sup> PAEA, §3622(d)(1)(A).

<sup>16</sup> *Id.* The PAEA allows USPS to increase market dominant prices by the CPI-U, with no additional limitation.

## 1. General Concerns

On the general side, three issues are worth noting. The first is *risk transfer*. External factors can affect average cost, either by changing the firm's cost or varying demand. Under COSR, the regulated firm is protected from those risks when it is allowed to charge a price equal to its actual costs divided by the demand for its service. Under PCR, the firm rather than consumer bears the risk that prices may not cover its average costs. The initial price from which subsequent prices are adjusted by  $CPI - X$  may need to be increased to compensate the regulated firm for the added risk it bears under PCR.<sup>17</sup>

A second issue that has received extensive attention is *quality*. Under PCR, the regulated firm cannot charge a higher price if it increases quality, and gets to keep the profits from the costs it might avoid by failing to maintain or even reducing the quality of its service.<sup>18</sup> This does not mean that under PCR a firm has no incentive to maintain product quality. Increasing quality increases demand for its service, which in turn typically increases profits.<sup>19</sup> This gives the regulated firm some incentive to maintain some level of product quality, and certainly not to minimize product quality. However, it is the case that the lower is the regulated price under PCR, the lower will be the quality of the service provided.<sup>20</sup>

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<sup>17</sup> Alexander, I. and T. Irwin, "Price Caps, Rate-of-Return Regulation, and the Cost of Capital," Public Policy for the Private Sector Note 87, World Bank (September 1996).

<sup>18</sup> Brennan (1989), *supra* n. 4.

<sup>19</sup> Firms are typically regulated in the first place only if they have monopolies. A hallmark of such monopolies is that they have high fixed costs and low variable costs. When that is the case, prices that keep the firm solvent will typically exceed the marginal cost of supplying additional services. Consequently, added sales will increase profits. It is the converse, that reduced sales lead to reduced profits, which motivates our concern with declining demand for USPS market dominant services and the salience of methods to adjust prices under PCR to keep USPS financially stable and solvent.

<sup>20</sup> In theory, an unregulated monopoly may set the quality of service at an excessive level in the perhaps unusual case where that added quality would lead its price to go up by more than that added quality is worth, on average, to its customers. If so, the result that PCR reduces incentives to maintain product quality could be consistent with re-

A third issue is the *inability of the government to commit to PCR over time*.<sup>21</sup> If PCR is to be in place for a long time, the likelihood increases that the regulated firm will have been either less or more productive than predicted, and the allowed price will either fail to cover the firm's cost or lead to large excess profits.<sup>22</sup> The former circumstance leads to financial instability or even insolvency, potentially illegal in not allowing the firm a chance to earn a "just and reasonable return," and inadvisable were it to cause the firm to stop providing the service. On the other hand, high profits may be politically untenable. Consequently, PCR prices are typically subject to review over time to prevent either outcome. Such reviews to some degree reduce the separation of prices from costs that PCR is intended to eliminate, and can attenuate the efficiency advantages of that separation.<sup>23</sup>

## 2. Concerns Regarding USPS

Some aspects of the USPS's situation present additional issues with price cap regulation. A first issue is that USPS, not being privately owned, is *not a profit maximizing firm*. As a publicly owned enterprise, USPS cannot be assumed to have the same incentives to control costs as a privately owned firm is generally assumed to have, because there is no party that gets to capture

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ducing quality from an excessive level to the level where the benefit of additional quality to customers just equals the cost of providing that added quality.

<sup>21</sup> Baron, D. "Information, Incentives and Commitment in Regulatory Mechanisms: Regulatory Innovation in Telecommunications," in Einhorn, M. (ed.), *Price Cap and Incentive Regulation in Telecommunications* (Boston: Kluwer, 1991): 47-75.

<sup>22</sup> For this reason, PCR is attractive as a transitional measure when a regulated sector becomes competitive. I believe the first application of PCR at the federal level in the U.S. was as a method to simplify the regulation of AT&T's long distance telephone service in what was expected to be the short time between the antitrust settlement that opened the long distance market to competition and when AT&T would face effective competition in that market. That, however, is not the case here.

<sup>23</sup> If COSR entails "regulatory lag," that is, a lengthy time period between adjustments of prices to keep them equal to average costs, prices are separated from costs during that lag period. If the "regulatory lag" time approaches the time between PCR reviews, the difference between COSR and PCR in terms of incentives to control costs diminishes.



the gains.<sup>24</sup> The economic rationales for PCR are based on the assumption that the regulated firm maximizes profits, and thus has an incentive to control costs when doing so would increase the wealth of its shareholders. When that assumption fails to hold, the prediction of greater productive efficiency loses its foundation.

A second concern that might seem unrelated is *the borrowing constraint*. As noted above, USPS by statute has exhausted its borrowing authority and is unable to borrow more, even from otherwise willing lenders. This raises the possibility that USPS cannot borrow money today to invest in equipment or reorganizations that might save it much more money in the future. Consequently, even if USPS is inclined to minimize costs, the borrowing constraint may prevent it from doing so over time.<sup>25</sup>

A last set of concerns involve *government obligations imposed on the USPS*. As a publicly owned enterprise, and one that throughout its history has largely been a branch of the U.S. government, USPS remains subject to policy driven obligations. Over time, the most consequential would be the “universal service obligation,” that all parts of the country should get the same quality of service at the same price, regardless of differences in cost. More recently is the assigned burden mentioned above to prefund expected spending on retiree health benefits. If these obligations are imposed without public funds to cover their costs, an otherwise reasonable PCR can leave and arguably has left USPS close to insolvent. An insolvent USPS would be unable not only to carry out these public mandates, but to provide its mail and delivery services.

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<sup>24</sup> The economic term for those who capture these gains is “residual claimant”. For more on this concept in the USPS context and, more broadly, the potential effects of the organizational form of USPS, see Crew, M. and T. Brennan, “Business Models: Some Implications for USPS,” in Crew, M. and T. Brennan (eds.), *Postal and Delivery Innovation in the Digital Economy* (New York, Springer, 2015): 1-15.

<sup>25</sup> This may also hold for investments to maintain service quality that would overtime pay for themselves through increased demand for USPS market dominant services.

All of these issues are worthy of attention as the Commission reviews the modern system of regulation as mandated by PAEA. This Declaration, however, is focusing on a fourth issue: *declining demand for market dominant services*. This includes not just reductions in demand caused by the exigency of the Great Recession. It also includes the persistent effect following the growth of electronic communication and billing through the Internet. As I explain in the next section, declining demand threatens USPS solvency and the revenue streams necessary to meet its own expenses as well as the public obligations to provide universal service and to prefund retiree health benefits.

### **III. DECLINING DEMAND AND ITS EFFECTS**

Ironically, the PAEA appears to have come into effect when demand for USPS market dominant services was at its greatest. The phenomenon since then of declining demand for mail services is well known, as is the role of electronic communication in that decline. Testimony a year ago from the General Accounting Office summarizes the situation:

USPS continues to face decreases in mail volume, its primary revenue source, as online communication and e-commerce expand. While remaining USPS's most profitable product, First-Class Mail volume in particular has significantly declined in recent years. For example, while total mail volume declined 27 percent from its peak in fiscal year 2006 (including a 1 percent decline in fiscal year 2015), First-Class Mail volume has declined to a greater extent—40 percent since its peak in fiscal year 2001 (with a 2 percent decline in fiscal year 2015).

USPS reported that the most significant factor contributing to the decline in First-Class Mail volume is the continued migration toward electronic communication and transaction alternatives—a migration USPS expects to continue for the foreseeable future. USPS added that the decline in First-Class Mail was exacerbated by the Great Recession that the National Bureau of Economic Research reported as lasting from December 2007 to June 2009. In the long run, USPS faces the risk of increasing diversion of mail to electronic alternatives and the possibility of future economic downturns that could negatively affect mail volumes. USPS has reported that although increased shipping and package volume has offset some of the declines in mail volume, this volume has a smaller profit margin than First-Class Mail.

USPS will need to be efficient in its processing and delivery of packages to capitalize on growth in that market.<sup>26</sup>

The GAO testimony goes on to say that declining demand along with increasing costs is responsible for “[t]he continued deterioration in USPS’s financial condition”.<sup>27</sup>

For a firm such as USPS whose prices are capped by regulation, declining demand harms the firm’s fiscal condition because that capped price is above marginal cost. Because price caps are set initially with the expectation that the firm’s total costs would be covered, the prices have to cover fixed costs as well as operating costs. In addition, services that are regulated at all typically have high fixed costs compared to variable operating costs, as that is what typically leads to having only one provider in a market and doubt as to whether competition could be sufficient to keep that provider from charging very high prices (relative to costs) to consumers. Consequently, revenues from lost business exceed any savings in operating costs due to the reduced use of their services.

Data from the Postal Regulatory Commission 2015 financial analysis of the USPS confirm this effect. Of the \$29.6 billion that year in revenues from First-Class Mail, \$13.1 billion is “attributable cost” and \$16.5 billion is “contribution to institutional cost”.<sup>28</sup> If one takes these respectively as shorthand for variable costs and the intended revenue used to include coverage of fixed costs, one could at least roughly estimate that each 1 percent decline in demand would reduce revenues by \$296 million and avoid only \$131 million in variable costs, reducing net revenues (in excess of variable costs) to USPS by \$165 million, the contribution to cover fixed cost,

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<sup>26</sup> Rectanus, L. Director, Physical Infrastructure Issues, General Accounting Office, “U.S. Postal Service: Financial Challenges Continue,” Testimony Before the Committee on Homeland Security and Governmental Affairs, U.S. Senate (Jan. 21, 2016), at 3-4.

<sup>27</sup> *Id.* at 3.

<sup>28</sup> Postal Regulatory Commission, “Financial Analysis of United States Postal Service: Financial Results and 10-K Statement, Fiscal Year 2015, (March 29, 2016), hereafter” Commission FY 2015 Analysis”, Appendix A at 88.

or about 55 percent (165/296) of total revenue. Overall that year, the revenue for market dominant mail and services was \$49.7 billion, with only \$27.1 billion being attributable to specific services and \$22.7 billion labeled as contribution to institutional cost. Using similar calculations, this implies that an overall reduction in market dominant volume of 1 percent would reduce overall USPS revenue (net of variable cost) by \$227 million. These are very rough estimates, again with assumptions regarding the extent to which attributable cost reflects variable cost, but these numbers are useful indicators confirming that declining demand hurts the financial position of USPS.

The GAO's findings, and the widespread sense that declining demand has been substantial and not helping the USPS's financial stability, go hand in hand with this expectation. Data from the PRC Annual Compliance Reports and the USPS Financial Analysis Reports allow some rough estimates of the magnitude of these effects. Relative to GDP, total mail volumes in FY 2012 were 40 percent below what they would have been had they followed the trend from FY 1970-96.<sup>29</sup> Mail volumes fell by 20 percent relative to that trend in the years from FY 2007 through FY 2012, following the enactment of PAEA and the onset of the Great Recession.<sup>30</sup> As stated above, GAO reported a 27 percent decline in mail volumes from FY 2006 to FY 2015, so the trend in an overall decline of mail has continued and cannot be attributed to the short-run effect of the 2007-09 Great Recession.<sup>31</sup>

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<sup>29</sup> Postal Regulatory Commission, "2012 Annual Compliance Determination" at 30.

<sup>30</sup> *Id.*

<sup>31</sup> A side note but a potentially important one is that a regulated firm facing declining demand may have market power. Clocks on mobile phones may have reduced demand for wristwatches, but a hypothetical wristwatch monopolist may still be able to raise prices substantially above the competitive level. Similarly, the increased electronic communication over the Internet may have reduced demand for market dominant mail services, but there may still be demand for market dominant services over a smaller customer base. In fact, if the most price-sensitive postal customers are the ones who have turned to electronic communication, an unregulated USPS might be able to raise prices even more than it could have absent declining demand. Brennan, T. and M. Crew, "Gross Substitutes vs.

## IV. WHAT MIGHT BE DONE TO THE PRICE CAP?

The current PAEA price cap mechanism does not incorporate a method for dealing with declining demand and the threat to financial solvency that might ensue. The book chapter by Brennan and Crew (2016) sets out a mechanism to adjust price cap rates in general, and for the USPS in particular, in the face of declining demand. I summarize that adjustment mechanism here.

### A. INITIAL POINTS OF CLARIFICATION ON PRICE CAP ADJUSTMENT

Before summarizing the price cap adjustment mechanism five points are important to observe.

First, the goal of the proposed adjustment might be called “net revenue neutrality”. The point is not to keep price cap rates aligned with average costs. Were that the goal, one would be back to cost-of-service regulation. Rather, the goal is to propose an adjustment mechanism that would keep USPS equally solvent regardless of how much demand has declined. In the terminology used to describe USPS’s finances, the criterion here for “equally solvent” for a service is maintaining the amount that the service contributes to institutional cost. Whether that contribution constitutes the appropriate amount is beyond the scope of this Declaration.

The second point is that the adjustment mechanism is designed to be simple. One could imagine attempting to develop an index that employs extensive data gathering and requires econometric estimation. Perhaps that level of detail would be ideal in an academic sense, but it is not appropriate in a regulated industry. It would make the estimation process complicated and

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Marginal Substitutes: Implications for Market Definition in the Postal Sector” in Crew, M. and T. Brennan (eds.), *The Role of the Postal and Delivery Sector in a Digital Age* (Cheltenham, UK: Edward Elgar, 2014): 1-15.

possibly delay designing a reasonable adjustment for years (and even invite a return to the detailed regulatory cost oversight that PCR was designed to avoid). Rather, to the extent possible, the adjustment mechanism is set up to rely upon straightforward numbers that are either routinely reported or amenable to consensus judgment. As I will illustrate below, the magnitudes of the effect of the adjustment, while meaningful, are not enormous on an annual average percentage basis.

The third point is that the adjustment should be based on events outside the control of USPS, such as the growth of the Internet and the consequent use of electronic communication instead of USPS services. In particular, if demand falls because USPS reduces the quality of service, it should not be rewarded through higher rates.

Fourth, this adjustment is only to relieve the adverse financial effects of declining demand. Specifically, it does not incorporate adjustments because of the costs of statutory mandates placed upon USPS in or since the PAEA, notably the requirement to prefund retiree health benefits.<sup>32</sup>

A fifth and last point to note is that the proposed adjustment factor for declining demand can also be applied to market dominant services where demand is increasing. When demand is declining, the adjustment would increase prices to preserve the contribution to institutional costs, and prevent threats to financial stability and solvency under PCR when demand falls. When demand is increasing, the adjustment would reduce prices, so that USPS does not profit excessively simply because of an increase in demand due to outside factors. The role of outside factors is symmetric: if USPS undertakes activities to increase demand, such as improving the quality of

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<sup>32</sup> How to adjust prices to cover the cost of this obligation is outside the scope of this Declaration.

service or its marketing, it should not be penalized by an adjustment that forces down the price of market dominant products.

## B. THE ADJUSTMENT MECHANISM

Any adjustment mechanism should work as an annual percentage adjustment to the price, just as the current CPI-U adjustment mechanism works under the PAEA for market dominant services (which currently has a productivity adjustment X term equal to 0). The adjustment mechanism in Brennan and Crew (2016) is designed to work within that framework. It is based on three terms:

1) To begin with the cause of the problem, the first term in the adjustment factor should be *the percentage by which demand has changed* for a particular class of mail or category of service for reasons outside the control of USPS. Call that percentage change in demand “Z”.<sup>33</sup> When demand is declining, Z will be a negative percentage.

2) For a market dominant service, where there is a presumption of economies of scale, declining demand adversely affects the solvency of USPS because it increases the average cost of providing that service. Because scale economies imply by definition that average costs fall with volume, a reduction in volume will increase average cost—simply the same effect in reverse. This is because a fixed cost for each product or class of mail has to be spread over a smaller amount of volume. Consequently, the second term needs to be the percentage that average cost changes for a given percentage change in volumes. In economics, the “percentage

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<sup>33</sup> Note again that this is not what Prof. Kwoka refers to by Z in his declaration. There, he uses Z to refer to other exogenous costs that a regulator will use to permit the regulated firm to raise price under price caps. See *supra* n. 13.

change per percentage change” is known as an elasticity.<sup>34</sup> In this case, that would be *the elasticity of average cost with respect to volume*.<sup>35</sup> We can write this as  $E_{AC}$ .

That sounds daunting and contradictory to the aspiration of having an adjustment factor that simple. However, there is a simple and readily available approximation to this term. Suppose that (1) the contribution to institutional cost is the equivalent in any given year of fixed costs,<sup>36</sup> and (2) average operating cost is approximately constant, at least within the range of volumes covered by the decline.<sup>37</sup> Then, it turns out that this elasticity of average cost is given by the relatively simple expression (adapted from Brennan and Crew, 2016 at 7-8).

$$E_{AC} = - \frac{\text{contribution to institutional cost}}{\text{total cost}}.$$

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<sup>34</sup> One can have elasticities of anything with respect to anything else. The most common elasticity in economics is the elasticity of demand, also known as the price or own-price elasticity of demand, which looks at the percentage change in demand for a good or service as a function of a percentage change in its price. One can also have income elasticities of demand, where one looks at percentage changes in demand based on percentage changes in income. One can similarly look at cross elasticities of demand (measuring percentage changes in the demand for one good based on percentage changes in the price for other goods) and supply elasticities, where one looks at supply rather than demand. Here, the elasticity of average cost with respect to output, but the “elasticity” measure is quite generic.

<sup>35</sup> Just to be clear, this “cost” includes both incurred fixed cost and contribution to overall USPS revenue, which I understand are labeled together as “contribution to institutional cost”.

<sup>36</sup> Two assumptions that lie behind this equivalence should be made explicit. First, all cost that varies with the volume of a particular product is attributed to that product and is not part of institutional cost. Second, all fixed cost is part of institutional cost. To the extent product specific fixed costs are counted as attributable costs, this expression will understate the elasticity of average costs. The implications of this are discussed in Section V of this declaration.

<sup>37</sup> Section V. below also discusses how the adjustment mechanism might be affected if this assumption does not hold.

<sup>38</sup> By definition,

$$E_{AC} = \frac{dAC}{dQ} \frac{Q}{AC},$$

where AC is average cost  $C(Q)/Q$ , where  $C(Q)$  includes contribution to institutional cost as a fixed cost.

$$\frac{dAC}{dQ} \frac{Q}{AC} = \frac{d[C(Q)]/Q}{dQ} \frac{Q}{C(Q)/Q} = \frac{[C'(Q)Q^{-1} - C(Q)Q^{-2}]Q^2}{C(Q)} = \frac{C'(Q)Q - C(Q)}{C(Q)}.$$

The first term in the numerator is marginal cost multiplied by output. If we assume marginal cost is constant, this term just equals variable cost. Consequently, the numerator is the negative of total cost less variable cost, or the negative of fixed cost. We can rewrite this as



The elasticity of average cost will typically be a negative number for regulated firms, reflecting the idea of economies of scale, that is, as volumes increase, average cost decreases.<sup>39</sup> To get a feel for the typical size of  $E_{AC}$ , in FY 2015 using the numbers above for all market dominant mail services, this elasticity would be  $-\$22.6\text{B}/\$49.7\text{B}$ , or about  $-.45$ .<sup>40</sup> When we multiply the elasticity of average cost by a decline in demand (negative change in demand) to get the percentage change in average cost in any given year, we multiply two negative numbers, and their product will be a positive number. If contribution to fixed costs, which is contribution to institutional costs, is zero, this elasticity would be zero as well. There would be no reason to increase price when demand falls if average cost is not rising as a consequence.

Multiplying the change in demand by this elasticity would give the change in price needed to cover the higher cost—assuming that a price increase itself does not lead to a further volume loss. Because of that possibility, we have to add the *price elasticity of demand* for the market dominant service to the adjustment. We abbreviate this elasticity of demand as  $E_D$ ; it is less than or at most equal to zero. Because adjusting price upward reduces demand, leading to another adjustment, the ultimate term is not as simple as multiplying the change in demand by the elasticity of average cost. But it turns out not to be that complicated. Following Brennan and Crew (2016 at 9), the complete price cap adjustment term is

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$$E_{AC} = -\frac{\text{fixed cost}}{\text{total cost}}.$$

If in turn we take fixed cost as the contribution to institutional cost, essentially the USPS's revenue net of variable costs before demand fell, we get the expression in the text. Total cost is that “fixed cost” plus variable cost.

<sup>39</sup> If average cost increases with output, the elasticity of average cost will be a positive number. Increasing average cost implies the absence of economies of scale that generally justify price regulation in the first place. However, if a product has negative contribution to institutional cost, then this elasticity would be positive. In such a case, a fall in volume would reduce the drain on institutional cost from that product, improving the USPS net financial position. Since the purpose of this mechanism is to keep the institutional cost the same regardless of a decline in volume, cutting rather than raising the price of that service would be appropriate under this mechanism.

<sup>40</sup> Commission FY 2015 Analysis, *supra* n. 28.

$$\text{Adjustment term} = Z \frac{E_{AC}}{1 - E_{AC}E_D}.$$

If the elasticity of demand is relatively small, it will not affect the adjustment factor much. A numerical example below will illustrate this. However, if the price elasticity is sufficiently large and  $E_{AC}E_D$  exceeds one—recall that both  $E_{AC}$  and  $E_D$  are negative numbers—there will be no finite adjustment term that maintains USPS solvency. This would lead to the “death spiral” or “graveyard spiral” that some have suggested could happen as demand falls. My sense, based in part on the numerical illustration below, is that the level of price increases one would see with this adjustment for declining demand would not lead to this circumstance.

As we have seen, the proposed adjustment mechanism employs only three terms: the percentage that demand has declined, the elasticity of average cost, and the price elasticity of demand for the service. As explained above, the elasticity of average cost can be approximated by the negative of the ratio of the contribution to the institutional cost to the total cost of the service. The elasticity of demand may not be known precisely, but may be approximated by other studies or judgments of industry experts, and as the numerical example below illustrates, may not matter that much in practice if it is not large.

### C. NUMERICAL ILLUSTRATION

An understandable concern would be whether this adjustment mechanism would lead to a radical change in prices for USPS market dominant products and services. Time does not permit a precise estimation of the adjustment for each market dominant product or service, so to investigate this. However, the following simplified numerical average, constructed for illustrative pur-

poses, shows that the price effects are not likely to be large. In this example, over the ten year period from 2006 to 2015, the effects are less than 1.3% per year.

The example begins with a representative figure for the decline in volumes. During that time, GAO reports a 27 percent decline in mail volumes, implying that  $Z$  in the adjustment mechanism would be  $-.27$ . Using an approximation based on the FY 2015 USPS financial data,<sup>41</sup> we can take as a representative elasticity of average cost  $E_{AC}$  the negative ratio of the contribution to institutional costs to the total costs for all market dominant products and services in 2015, which was calculated to be  $-.45$ .<sup>42</sup> For a representative price elasticity of demand  $E_D$ , I will use  $-.3$ , roughly the volume-weighted average of the elasticities of demand of the three largest market dominant services in terms of revenue.<sup>43</sup> This  $-.3$  figure reflects some elasticity but also that market-dominance implies significant buyer resistance to price increases. If so, we would have that

$$\text{Adjustment term} = Z \frac{E_{AC}}{1 - E_{AC}E_D} = (-.27) \frac{-.45}{1 - (-.45)(-.3)} = 14.0 \text{ percent.}$$

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<sup>41</sup> Commission FY 2015 Analysis, *supra* n. 28.

<sup>42</sup> As noted earlier, as the purpose of this adjustment is to maintain USPS's ability to contribute revenue in the face of declining demand for a market dominant product, we can treat this contribution as equivalent to fixed cost not included in attributable cost, that is, "contribution to institutional cost". "Total cost" similarly includes this revenue contribution.

<sup>43</sup> This calculation of  $-.3$  is purely for illustrative purposes. To come up with the number, I used roughly the weighted average of the price elasticities of demand for the three largest contributors to the USPS's revenues, First-Class Single-Piece Letters, First-Class Presort Letters, and Standard Regular Letters, where the weights are the volumes of each service. The elasticities for these services ( $-0.0995$ ,  $-0.1871$ , and  $-0.4787$  respectively) come from USPS, Market Dominant Demand Analyses, FY 2016 (Jan. 23, 2017). The volumes (20576128, 40174244, and 47720675 respectively) come from Commission FY 2015 Analysis, *supra* n. 28. The volume-weighted average elasticity is  $-0.2987692$ , which for the illustrative purposes here I approximate as  $-.3$ . These are the most recent numbers I have. I recognize that these are not the same year, and it should also be noted that the volume data I used included cards as well as letters, which are a very small fraction of the overall amount. I believe that adjusting for the same year and for potentially different elasticities for cards and letters would have no meaningful effect on justifying  $-.3$  as a number I use for the illustration here.

A 14 percent adjustment may look large, but it is important to keep in mind that this adjustment would be spread over a ten year period. If one had the same adjustment over each of the ten years, the increase would be about a 1.3 percent price increase per year. In practice, it would not be the same for all years and for all classes of mail, or even products if that can be calculated, as the price elasticity of demand, average cost elasticity estimates, and the change (decline) in demand, are not the same for all classes or products in all years. But this serves to advise the Commission that this adjustment factor is not too high to consider implementing. Moreover, if the potentially contentious demand elasticity term were ignored—that is, assumed to be zero, meaning inelastic demand—this ten year price increase would be just  $(-.27)(-.45)$  or 12.15 percent, which would be a 1.15 percent increase per year on average, not a strikingly enormous difference between a rough estimate with an elasticity of demand of  $-.3$ , and possibly well within the range of the error of any attempt at more precise measurements.

## V. IMPLEMENTATION ISSUES AND CONCLUSION

The adjustment mechanism proposed above provides a simple and transparent way to preserve the solvency of USPS in the face of declining demand. The mechanism proposed here relies on three components: the percentage that demand declined, the elasticity of average cost (approximated by the ratio of fixed to total cost), and the price elasticity of demand, as given by

$$\text{Adjustment term} = Z \frac{E_{AC}}{1 - E_{AC}E_D}.$$

To review, the decline in demand reduces the ability of the USPS to obtain the net revenues that it otherwise would have received. The elasticity of average cost is the main measure for how much prices would have to increase to make up for those lost revenues. Price elasticity of de-

mand enters into the mechanism because when prices are increased, demand falls further, requiring an additional adjustment.

No proposal to change regulation is going to be free from complexities and controversies when it comes to implementation. I review implementation issues that may arise with each of the three components in the adjustment mechanism. I conclude with an assessment of a likely overarching issue in the debate over adoption and implementation of an adjustment mechanism—whether the USPS overall is charging prices that are too high or too low.

*Declining demand:* As noted above, the adjustment in prices should depend on only the amount demand has declined for reasons outside of the control of the USPS. Holding other components to the adjustment mechanism constant, the proposed mechanism leads to higher prices, the greater is the decline in demand. One can expect that those who would prefer lower prices for the USPS market dominant service or services in question will want to contend that declines in demand for the USPS services are the result of the USPS's actions, in particular, reductions in the quality of service. In addressing such contentions, the Commission should consider requiring opponents of the adjustment to show that there have been quality reductions that are the result of the USPS's operational decisions or because of changes to its regulatory environment, e.g., being given legal permission to reduce delivery days or increase delivery times.

*Elasticity of average cost:* The elasticity of average cost measures how much prices would have to rise for a given percentage reduction in demand in order for that decline in demand to have no effect on the USPS's income. To make this term operational, I proposed two approximations: (1) if marginal cost is constant, this elasticity equals the negative of the ratio of fixed costs to total cost, and (2) that the relevant fixed cost here is the reported contribution to

institutional cost. Those together imply that an estimate of the elasticity of average cost will be the negative of the ratio of the contribution to institutional cost to total cost.

The larger is the elasticity of average cost, holding other components constant, the greater the price adjustment that is necessary to meet that financial objective. Therefore, those who want to keep the price of the USPS service low would want to argue that this elasticity is low. With this approximation, this would entail showing that the contribution to institutional cost exaggerates fixed cost. In other words, the claim would be that some institutional costs are in fact variable. I am not an expert in USPS accounting, but one would expect that costs that vary with volume would be regarded as attributable, so this is not likely. On the other hand, if some of the attributable cost of a particular service is in fact fixed, even if product-specific, the ratio of the fixed cost to total cost would exceed the ratio of the contribution to institutional cost to total cost, suggesting a larger value for EAC, leading to a larger adjustment in price. A larger price increase will be necessary to preserve USPS's ability to cover any product-specific fixed cost as well as maintain its contribution to institutional cost. .

A second possible contention is that marginal cost is not constant. If it is not, one would expect marginal cost to be increasing with volume and thus be higher than average variable cost. USPS avoids more cost as volume declines than would be indicated by equating marginal cost to average attributable cost. This in turn implies that the requisite price adjustment would be lower than that entailed by the simple adjustment equation here. As that adjustment looks to be already fairly small, around 1.3% per year on average, attempting to correct for this may not be enough

of a change to warrant considerable effort to estimate marginal cost more accurately than is indicated by average attributable cost.<sup>44</sup>

*Price elasticity of demand:* Holding constant the percentage decline in demand and the elasticity of average cost, the larger is the price elasticity of demand, the larger will be the adjustment in price. Some market-dominant products have price elasticities of demand greater in absolute value than  $-.3$ , so they would have somewhat higher price adjustments. This is because the increase in price based solely on the decline in demand and the elasticity of average cost will reduce volumes further the more elastic is demand, requiring a greater price increase. One would accordingly expect those opposed to price increases to argue that the price elasticity of demand is small. To the extent the Commission has a standard accepted source of estimates of the price elasticity of demand, contention over this aspect of the formula should be reduced. It is also important to observe that this effect will not be great. However, holding the decline and elasticity of average cost the same as in the numerical example, changing the elasticity of demand from  $-.3$  to  $-.8$  would change the price adjustment over ten years from 14% to 19%, or on average the annual price increase would go from 1.3% to 1.75% per year.

This aspect of implementation brings out a potential longer-run economic issue with this mechanism. If applied separately to each market dominant product and service of the USPS, it would mean that over time prices of a good or service would be higher, all else equal, the higher is the price elasticity of demand. However, the well-known “Ramsey pricing” rule for efficient

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<sup>44</sup> Approximating marginal cost by average variable (here, attributable) cost is not unusual. A long-standing recommendation in antitrust law is that in assessing whether a firm set a price below its marginal cost when evaluating a claim of predatory pricing, average variable cost is an appropriate proxy for marginal cost because it is “much easier to calculate from accounting records than is short-run marginal cost”. Hovenkamp, H. “The Areeda–Turner Test for Exclusionary Pricing: A Critical Journal,” *Review of Industrial Organization* 46 (2015): 209-228, 213, discussing Areeda, P. and D. Turner, D. F. (1975). “Predatory Pricing and Related Practices Under Section 2 of the Sherman Act,” *Harvard Law Review* 88 (1975): 697–733.

coverage of a regulated firm's costs prescribes an "inverse elasticity" principle: the divergence of price from marginal cost should be lower, the higher is the price elasticity of demand.<sup>45</sup> In our terms, this would be that the ratio of the contribution to institutional cost to total cost should be inversely related to the elasticity of demand.

The difference arises because the adjustment mechanism I propose and the Ramsey "inverse elasticity" principle is that the Ramsey rule is about what the contribution to institutional cost from any service should be, whereas the proposed adjustment takes the contribution to institutional cost as given. The goal of the adjustment mechanism is to preserve that contribution, not to correct it because of deviations from the Ramsey rule. Decisions regarding whether the contributions some individual market dominant services make should be increased and others' contributions decreased, whether because of the Ramsey principle or other considerations, there is a separate issue. Moreover, the numerical illustration suggests that the price effects of the adjustment mechanism would not in general be sufficiently significant to in prices to necessarily force reconsideration of the level of contributions.<sup>46</sup>

This brings me to the last issue in a debate about the adjustment mechanism: whether the USPS is earning too little or too much money. As noted above, the purpose of this proposed adjustment mechanism is to maintain the USPS's net revenue position when demand falls.<sup>47</sup> To the

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<sup>45</sup> Baumol, W. and D. Bradford, "Optimal Departures from Marginal Cost Pricing," *American Economic Review* 60 (1970): 265-83. The basic reason is that the economic welfare lost from a markup of price over marginal cost is greater the more such an increase brings about a reduction in volume, that is, has a higher price elasticity of demand. As a consequence, the margins should be greater where that reduction in volume would be smaller, that is, with products and services where the price elasticity of demand is smaller.

<sup>46</sup> For some market dominant products and services, the reported elasticities are in the -.75 to -.85 range. Applying the mechanism to these services could lead to substantial price increases, holding the level of contribution constant, so these services might warrant consideration of the size of their contributions.

<sup>47</sup> Recall that the same mechanism could justify reducing prices for market dominant products and services when demand increases.



extent that implementation of the formula is based upon the degree to which USPS is covering its costs overall, one is in effect moving away from price cap regulation back to cost-of-service regulation.<sup>48</sup> However, a test of whether this proposed mechanism is working as intended is whether it is improving or harming USPS's financial condition over time. The Commission may want to review USPS prices periodically under PCR to reduce the risk of insolvency on one side and the potential controversy associated with high profits on the other. However, that should be separated from the question of whether the USPS's prices can and should be adjusted in the interim because of declining demand for its services.

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<sup>48</sup> This is not to say that the USPS rates for market dominant services should not be adjusted to take into account the cost of requirements imposed by Congress or the Commission. How those adjustments should be made is not the purpose of this Declaration.

## VERIFICATION

I, Timothy J. Brennan, declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge. Executed on March 20, 2017.

A handwritten signature in black ink, appearing to read 'Timothy J. Brennan', with a long, sweeping horizontal stroke at the end.

Timothy J. Brennan

^ **Timothy J. Brennan**

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**Academic Background:**

Ph. D., Economics, University of Wisconsin, August, 1978 (Dissertation: *On the Microfoundations of Keynesian Macroeconomics*, R. Bryce Hool, advisor).

M. A., Economics, University of Wisconsin, May, 1976.

M. A., Mathematics, University of Wisconsin, May, 1975.

B. A., Mathematics, University of Maryland, December 1973 (high honors, honors in mathematics).

**Honors:** PURC Distinguished Service Award, Public Utility Research Center,  
University of Florida, 2013.

International Fellow, C.D. Howe Institute, Toronto, Ontario, Canada, 2010.

T. D. MacDonald Chair, Competition Bureau, Industry Canada, 2006.

Bearman First-Year Seminar Professor, UMBC, 2003-04.

EPCOR Distinguished Lecturer, University of Alberta, October 2001.

McGee Lecturer in Public Policy, Vanderbilt University, March 2000.

Gilbert White Fellow, Resources for the Future, 1995.

U.S. Department of Justice, Antitrust Division Award of Merit, 1985;

Meritorious Awards: 1982, 1984; Special Achievement Awards: 1979, 1980

Wisconsin Alumni Research Foundation Graduate Fellowships:

Mathematics, 1974-1975; Economics, 1976-1977;

Doctoral Dissertation in Economics, 1977-1978.

Valedictorian, University of Maryland, December 1973.

**Positions Held:**

1990-present: Professor, Public Policy and Economics, University of Maryland Baltimore County (associate professor 1990, tenured 1991, full professor 1993)

1995-present: Senior Fellow, Resources for the Future, Washington, DC

2010-present: Special Advisor, Brattle Group, Washington, DC

2014: Chief Economist, U.S. Federal Communications Commission

- 2006: T.D. MacDonald Chair in Industrial Economics,  
Canadian Competition Bureau, Industry Canada
- 2003-2005: Staff consultant, Bureau of Economics, Federal Trade Commission
- 1996-1997: Senior Economist for Industrial Organization and Regulation, Council of Economic Advisers, Executive Office of the President, Washington, DC
- 1995: Gilbert White Fellow, Resources for the Future, Washington, DC
- 1986-1989: Associate Professor of Public Policy, Communication, and Economics,  
Graduate School of Arts and Sciences, George Washington University
- 1978-1986: Economist, Antitrust Division, U. S. Department of Justice

**Department of Justice Responsibilities:** Primary Division economist in the areas of telecommunications, broadcasting, and intellectual property. Staff economist, *U. S. v. AT&T*, *U. S. v. Natl. Assn. of Broadcasters*, amicus briefs concerning ASCAP, NCAA, state action cases. Other major matters include those listed below under Official Publications. From 1986-1999, consulted to Division on a part-time staff basis on intellectual property, telecommunications industry structure, computer software practices, energy regulation, and broadcasting policy. Provided policy advice to antitrust and regulatory officials from Eastern Europe, Mexico, and other countries with developing market economies. Served as a contract consultant to the Division through UMBC, 1999-2000.

#### **Professional Association Memberships:**

American Bar Association (associate member)  
 American Economic Association  
 Association for Public Policy Analysis and Management  
 Association of Energy and Resource Economists  
 Canadian Economics Association  
 Environmental Law Institute (associate member)  
 Industrial Organization Society  
 International Association for Energy Economics  
 Society for Benefit-Cost Analysis  
 Society for Economic Research on Copyright Issues  
 U.S. Association for Energy Economics

#### **Editorships:**

Co-editor, *Economic Inquiry*

#### **Editorial Boards:**

*Journal of Regulatory Economics*  
*Communication Law and Policy*  
*Information Economics and Policy*  
*International Journal of the Economics of Business*

#### **Refereeing:**

*Agricultural and Resource Economics Review*, *American Economic Review*, Cambridge University Press, *Canadian Journal of Economics*, *Communication Law and Policy*, *Contemporary Economic Policy*, *Contemporary Policy Issues*, *Eastern Economic Review*, *Ecological Economics*, *Economic Inquiry*, *Economics and Philosophy*, Edward Elgar, *Energy*, *Energy Economics*, *Energy Efficiency*, *Energy Journal*, *Energy Policy*, *Energy Studies Review*, *Environment and Development Economics*, *Government and Policy*, *Growth and Change*, *Information Economics and Policy*, *International Journal of the Economics of Business*, *Journal of American History*, *Journal of Broadcasting and Electronic Media*, *Journal of Business Economics*, *Journal of Communication*, *Journal of Consumer Culture*, *Journal of Economic Education*, *Journal of Economic Issues*, *Journal of Economics and Management Strategy*, *Journal of Environmental Economics and Management*, *Journal of the European Economic Association*, *Journal of Industrial Economics*, *Journal of Institutional Economics*, *Journal of Policy*

*Analysis and Management, Journal of Political Economy, Journal of Public Economics, Journal of Regulatory Economics, Journal of Theoretical Politics, Land Economics, Management Science, MIT Press, Oxford University Press, Portal, Quarterly Journal of Economics, RAND Journal of Economics, Regulation, Research in Law and Economics, Research in the History of Economic Thought and Methodology, Resource and Energy Economics, Review of Industrial Organization, Review of Network Economics, Review of Social Economy, Routledge Publishing, Scottish Journal of Political Economy, Smith Richardson Foundation, Southern Economic Journal, Sustainability, University of Michigan Press, University of Minnesota Press, Utilities Policy, Wiley Encyclopedia for Operations Research and Management Science, Zeitschrift für Nationalökonomie.*

## **Presentations:**

*U.S. Government:* Council of Environmental Quality, Department of Justice, Federal Trade Commission, Federal Communications Commission, Congressional staff, Agency for International Development, Department of Energy, Government Accountability Office, President's Economic Recovery Advisory Board, Office of Technology Assessment, Food and Drug Administration.

*International Government:* Australian Competition and Consumer Commission, Canadian Senate Standing Committee on Transport and Communications, Industry Canada—Competition Bureau, Costa Rica Commission for the Protection of Competition (COPROCOM), Mexico Secretariat for Communication and Transport, Mexico Competition Commission, Netherlands Embassy, New Zealand Embassy, Romanian Competition Council, Swedish Competition Authority (Konkurrensverket), United Kingdom Office of Fair Trading, Uzbekistan State Committee for Demonopolization and Competition.

*Professional Associations:* American Bar Association (Antitrust Section), Association of the Bar of the City of New York, American Economic Association, Association for Education in Journalism and Mass Communication, Association for Evolutionary Economics, Association for Institutional Thought, Association for Public Policy Analysis and Management, Association for Social Economics, Canadian Bar Association, Canadian Economics Association, Eastern Economic Association, Electronic Technicians Association, History of Economics Society, Industrial Organization Society, International Association of Energy Economists, International Network for Economic Method, International Telecommunications Society, National Association of State Utility Consumer Advocates, Society for Benefit-Cost Analysis, Society for Economic Research on Copyright Issues, Southern Economic Association, Transportation and Public Utilities Group, Vancouver Competition Policy Group, U.S. Association for Energy Economics.

*Institutional:* American Enterprise Institute, AT&T Bell Laboratories, Brookings Institution, C. D. Howe Institute (Canada), Economists Inc., eSapience, Freedom Forum Media Studies Center, Institute for Policy Analysis (Australia), International Communications Forecasting Conference, Lincoln Institute of Land Policy, Maryland Clean Energy Technology Incubator, Mansfield Center for Pacific Affairs, MGF Webb (New Zealand), National Economists Club, National Research Council, Phoenix Center for Advanced Legal and Economic Policy Studies, Resources for the Future, Technology Policy Institute, Telecommunications Policy Research Conferences, TransAlta Corporation (Canada), Transpower NZ (New Zealand) World Bank.

*U.S. Academic:* Ball State University (Digital Policy Institute), City University of New York (Baruch College School of Public Affairs), Columbia University (Institute for Tele-Information), Emory University, George Mason University (Center for Public Choice, Law School, School of Public Policy, Learning in Retirement Institute), George Washington University (School of Law, Department of Economics), Georgetown University (Law School, Public Policy Institute, McDonough School of Business, Center for Business and Public Policy), Harvard University (John F. Kennedy School of Government, Harvard Law School), Johns Hopkins University (Nitze School of Advanced International Studies, Center for Population Studies), Louisiana State University, Michigan State University (Institute for Public Utilities), Middle Tennessee State University, New York University School of Law (Institute for Policy Integrity), Northwestern University (Department of Communication Studies, Annenberg Washington Program), Oberlin College, Penn State (College of Earth and Mineral Sciences), Rutgers University (Advanced Workshops in Regulation and Public Utility Economics), University of California-Berkeley (UC Energy Institute), Uni-

versity of California-Davis (Institute of Government Affairs), University of California-Washington Center, University of Delaware (Center for the Study of Values), University of Florida (Public Policy Research Center), University of Maryland Baltimore County, University of Maryland-College Park, University of Maryland School of Law, University of Pennsylvania (Department of Economics, Annenberg School for Communication, Law School), University of Southern California (Annenberg School for Communication), University of Texas (Department of Economics, Law School), Vanderbilt University (Owen School of Business, Department of Economics), Virginia Polytechnic Institute, West Virginia University.

*International Academic:* Carleton University (Department of Economics), Curtin Graduate School of Business (Centre for Research in Applied Economics, Department of Economics and Finance, School of Public Policy), Deutsche Hochschule für Verwaltungswissenschaften Speyer (German University of Administrative Sciences-Speyer), Ecole Normale Supérieure (Paris School of Economics), Florence School of Regulation Hong Kong Economic Association (Nankai University, Tianjin, China), Karlsruhe Institute of Technology (Telecommunications Economics Research Group), University of Alberta (School of Business), University of Auckland (School of Business), University of British Columbia (Sauder School of Business), University of Calgary (Van Horne Institute, Department of Economics).

#### **Consultancies:**

Brattle Group  
Cellular Telephone Industry Association  
Competition Bureau, Industry Canada  
Criterion Economics  
Energy Information Administration, U.S. Department of Energy  
Environmental Law Institute  
ERS Group  
Exeter Associates  
Federal Communications Commission  
International Law Institute  
Postal Regulatory Commission (Public Representative)  
Robinson, Curley and Clayton  
World Bank

#### **Other Professional Activities:**

Panelist, What Do the Election Results Portend for Regulatory Policy, Southern Economic Association 86<sup>th</sup> Annual Conference, Washington, DC (Nov. 19, 2016).  
Panelist, Promoting Broadband Investment in the 21<sup>st</sup> Century, Phoenix Center 2016 Annual Telecoms Symposium, Washington, DC (Nov. 15, 2016).  
Expert Interview, The Role and Value of the U.S. Postal Monopoly, Physical Infrastructure Team, Government Accountability Office, Washington, DC. (Oct. 13, 2016).  
Panelist, "The FCC's Path to Populism: A Search for Relevancy in the Digital Age," George Washington University Public Policy Institute, Washington, DC (Jul. 11, 2016).  
Interviewee, Global Competition Review, on the potential role of environmental considerations in decisions whether to prosecute potential antitrust violations (Jun. 16, 2016).  
Participant, Anchoring and Black Swans: Reconsidering Risk Aversion and the Future of Commercial Space, Invitation-Only Experts Workshop, Resources for the Future, Washington, DC (Mar. 22, 2016).  
Panelist, "The Role of Benefit-Cost Analysis in Government Decisions," Society for Benefit-Cost Analysis 8<sup>th</sup> Annual Meeting, Washington, DC (Mar. 18, 2016).  
Participant, Joint RFF/Waseda Workshop on Sustainable Energy in US and Japan: The Role of Renewable Energy and Energy Efficiency, Washington, DC (Mar. 11, 2016).

Interviewee, SNL Energy on relationship between competition in energy markets and emissions (Feb. 16, 2016).

Panelist, “Regulatory Revival and its Effect on the Communications Industry,” Phoenix Center 2015 Annual Telecoms Symposium, Washington, DC (Dec. 1, 2015).

Panelist, Government Policy and Innovation, Resources for the Future and BASF, Washington, DC (Oct. 2, 2015).

Interviewee, Sydney Morning Herald on net neutrality (Aug. 7, 2015).

Organizing Committee, Telecommunications Policy Research Conference, 2015-16.

Panelist, The Economics of Bargaining, DC Industrial Organization Conference, Washington, DC (March 6, 2015).

Panelist, Roundtable with Agency Heads of Economics, Global Competition Review Live 4<sup>th</sup> Annual Anti-trust Leaders Forum, Miami, FL (Feb. 6, 2015).

Roundtable on research proposals on the economics of privacy/data security, George Mason University School of Law (Jan. 22-23, 2015).

Interviewee, Bloomberg News re GrubHub-Seamless proposed merger (May 22, 2013).

Associated Center Faculty, Center for Research on Regulated Industries, Rutgers Business School (2012-present).

Co-Organizer, Conference on Postal and Delivery Economics, Center for Research in Regulated Industries, Rutgers University (2012-15).

Invited Participant, Research Roundtable on the Economics of Privacy and Data Security, George Mason University School of Law, Arlington, VA (Dec. 12-13, 2012, Dec. 11-12, 2013, Mar. 7, 2014).

Interviewee, The Morning Briefing Show with Tim Farley on the POTUS Channel for SiriusXM (Nov. 15, 2012).

Invited Participant, Fifth Annual Conference on Antitrust Economics and Competition Policy, Searle Center, Northwestern University School of Law (Sep. 21-22, 2012).

Energy Efficiency Roundtable, Sloan Foundation, New York, NY (Aug. 23-24, 2012).

Reviewer, *Choice*, 2012-present.

Interviewee, Financial Post (Toronto) on Canadian administrative payments for abuse of dominance law violations (May 11, 2012).

Invited Participant, Second Annual Conference on Competition, Search, and Social Media, George Mason University School of Law, Arlington, VA (May 16, 2012).

Interviewee, Fort-Worth Star Telegram, on Texas electricity markets (Apr. 11, 2012).

Invited participant, Research Roundtable on *The Law & Economics of Search Engines and Online Advertising*, George Mason University School of Law, Arlington, VA (Nov. 3-4, 2011).

Invited participant, Fourth Annual Conference on Antitrust Economics and Competition Policy, Northwestern University School of Law, Chicago, IL (Sept. 23-24, 2011).

Public Comments Filed on Draft Merger Enforcement Guidelines, Canadian Competition Bureau (Aug. 31, 2011).

Participant, C.D. Howe Institute Competition Policy Council meeting on foreign investment in telecommunications, Toronto, ON (via conference call, Jun. 17, 2011).

Member, Competition Policy Council, C.D. Howe Institute, Toronto, Ontario, Canada, 2011-.

Peer reviewer, draft *State of Maryland Long-Term Electricity Supply* (2011).

Department of State Consultation with Mr. Viroslov Mircea, Romanian Competition Council (Jun. 8, 2011).

Peer Reviewer, RAND Corporation, 2011.

Interviewee, Electricity Decoupling and Outages, Platt's Electric Power Daily (Feb. 5, 2011).

Participant, Maryland Public Service Commission Advanced Metering Infrastructure Working Group, 2010-2013.

Interviewee, Net Neutrality vs. Minimum Quality Standards, German Public Radio (Nov. 22, 2010).

Panelist, "Digital Communications, Economic Development and Policy Challenges," Digital Policy Institute, Indianapolis, IN (Oct. 15, 2010).

International Fellow, C.D. Howe Institute, Toronto, Ontario, Canada, 2010-.

Panelist, "Fair Pricing: A Conference on Ethics and Dynamic Pricing," Rutgers Business School (Apr. 9, 2010).

Keynote Speaker, "U.S. Energy Policy in Transition," Robert F. Lanzillotti Public Policy Research Center, Warrington College of Business Administration, University of Florida, Gainesville, FL (Mar. 18, 2010).

Proposal Reviewer, Energy Efficiency Community Block Grant Program, U.S. Department of Energy (Mar. 2010)

Interviewee, WYPR-FM, on Maryland as a Cybersecurity Hub (Feb. 5, 2010).

Moderator, "The Role of Prizes in Innovation and Entrepreneurship," First Wednesday Seminar, Resources for the Future, Washington, D.C. (Dec. 2, 2009).

Energy efficiency presentation and discussion, White House Council on Environmental Quality (Oct. 6, 2009).

Energy efficiency presentation and discussion (teleconference), President's Economic Recovery Advisory Board (Sep. 2, 2009).

Keynote Speaker, Australian Competition and Consumer Commission 10<sup>th</sup> Regulatory Conference, Surfer's Paradise, Queensland, Australia (July 30, 2009).

Visiting Fellow, School of Economics and Finance, Curtin Business School, Perth, WA, Australia (July 20-25, 2009).

Panelist, "Climate Change, Cap-and-Trade, Renewable Electricity and Efficiency Mandates: How Do They Fit Together?" Technology Policy Institute, Rayburn House Office Building, Washington, DC (June 12, 2009).

Adviser, Environmental Law Institute, "Estimating U.S. Government Subsidies to Energy Sources: 2002 – 2008," [http://www.elistore.org/Data/products/d19\\_07.pdf](http://www.elistore.org/Data/products/d19_07.pdf) (2009)

Member, Maryland Comprehensive Energy Plan Advisory Committee, 2009-10 (Annapolis public meeting Dec. 1, 2009).

Panelist, "Economic Standards for Considering Abuse of Dominance: Canadian and U.S. Perspectives," Canadian Bar Association, National Competition Law Section, Economics Committee and American Bar Association, Section of Antitrust Law, Economics Committee and International Committee (via teleconference, May 27, 2009).

Interview, Congressional Quarterly, antitrust policy and removing immunity for freight rail (May 27, 2009).

Featured Interview, Maryland electricity policy, Maryland Commons, [http://marylandcommons.com/editions/21/content\\_items/95](http://marylandcommons.com/editions/21/content_items/95), (May 4, 2009).

Electricity transmission economics interagency meeting, White House Council on Environmental Quality (May 11, 2009).

Interviewed re President Obama's Address to the Joint Session of Congress regarding energy policy, Greenwire (Feb. 24, 2009).



Discussant, FTC Hearings on Resale Price Maintenance, Federal Trade Commission, Washington, DC (Feb. 19, 2009).

Interviewed re purchase of Constellation Energy, WYPR radio (Sep. 23, 2008).

Chair, Panel on Current Issues in Canadian Competition Policy, Phelps Centre for the Study of Government and Business (University of British Columbia), Canadian Economics Association, Vancouver, British Columbia (Jun. 6, 2008).

Moderator, “Curbing Electricity Demand: Who, How and Why,” First Wednesday Seminar, Resources for the Future, Washington, D.C. (Apr. 9, 2008).

Expert Reviewer, “Federal Financial Interventions and Subsidies in Energy Markets 2007,” Energy Information Administration, U.S. Department of Energy (Feb. 2008).

Member, Working Group, Demand-Side Management Cost Benefit Analysis, Maryland Public Service Commission (Jan. 2008).

Panelist, Electricity Stakeholders Outreach Meeting, Maryland Energy Administration, State House, Annapolis, MD (Sep. 5, 2007).

Interviewee, “Greater Baltimore Committee: Issues and Answers,” Comcast News Channel (July 29, 2007).

Panelist, Maryland Energy Summit, State Senate Office Building, Annapolis, MD (July 25, 2007).

Panelist, “Can Antitrust Be Forward Looking?” Federal Trade Commission, Washington, DC, May 24, 2007.

Panelist, “Predatory Buying,” U.S. Department of Justice and Federal Trade Commission Joint Hearings on Section 2 Single Firm Conduct, Washington, DC, June 22, 2006.

Panelist, “Holistic Approaches to Competition Enforcement,” United Kingdom Office of Fair Trading, London, England, June 20, 2006.

Consultant, Telecommunications Policy Rule and Local Regulatory Forbearance, Competition Bureau, Industry Canada, Gatineau, Quebec, 2005.

Invited Participant, “The Theoretical and Empirical Analysis of Bundling,” George Mason University School of Law, May 20, 2005.

Regulatory Expert on Natural Monopolies and Telecommunications, Technical Assistance to the Republic of Uzbekistan for Institutional Strengthening of the State Committee on Demonopolization and Competition Development, International Law Institute, 2004-05.

Chair, Antitrust Enforcement Panel, International Industrial Organization Conference, Atlanta, GA, Apr. 9, 2005.

Chair, Telecommunications Policy Panel, International Industrial Organization Conference, Chicago, IL, Apr. 24, 2004.

Participant, “Electricity Workshop—Security of Supply: Operating Reserves and Capacity Markets, Transmission and Interconnection, and Demand Response,” Royal Netherlands Embassy, Washington, DC, March 9-10, 2004.

Energy Information Administration, U.S. Department of Energy, Transmission Data Advisory Group, 2004.

Proposal Reviewer, National Science Foundation: Programs in Economic, Ethics and Value Studies, Law and Social Policy, Human and Social Dynamics, 1992, 1996, 1999, 2000, 2004.

Advisory Committee, Retail Electricity Deregulation Index, Center for the Advancement of Energy Markets, 2000-04.

Interviewee, CBC Radio “Ottawa Morning,” regarding 2003 blackout, Aug. 19, 2003.

Reviewer, Electric Power Research Institute “Framework for the Future” Report, May 2003.

Default Electricity Provider Forum, Center for the Advancement of Energy Markets, 2002-2003.

Chair, "O Kilowatts, Where Art Thou" Panel, Association for Public Policy Analysis and Management, Dallas, TX, Nov. 8, 2002.

Panelist, Broadband Forum, National Telecommunications and Information Administration, U.S. Department of Commerce, Oct. 12, 2001.

EPCOR Distinguished Lecturer, University of Alberta, Edmonton, Alberta, Oct. 4, 2001.

McGee Lecturer in Public Policy, Vanderbilt University, March 1, 2001.

Interviewee, *De Zeit*, Jan. 25, 2001.

Interviewee, California electricity deregulation, TV2/Danmark, Feb. 7, 2001.

Advisory Committee, Federal Communications Commission "Connecting the Globe" Project, 2000.

National Association of Regulatory Utility Commissioners Uniform Business Practices Workshop, March 3-4, 2000.

Report Reviewer, National Research Council, Board on Infrastructure and the Constructed Environment, 1999.

Proposal Reviewer, Smith Richardson Foundation, 1998.

Interviewee, U.S. telecommunications policy, China Television (Taiwan), Jun. 25, 1998.

Presenter, "Overview of Electricity Competition Policy Issues," League of Women Voters, Vineyard Haven, MA, Sep. 21, 1997.

Organizing Committee, Telecommunications Policy Research Conference, 1994-96.

Advisor, Mexico Secretariat for Communications and Transport and Mexico Competition Commission, Mexico City, Mexico, August 29-30, 1995.

Advisory Panel, *Wireless Technologies and the National Information Infrastructure*, Office of Technology Assessment, 1994-95.

Advisory Panel, Rights for Electronic Access to and Delivery of Information (READI) Program, Coalition for Networked Information, 1993-95.

Socioeconomics Grant Review Panel, Environmental Protection Agency, 1992-94.

Advisor, Slovak Antimonopoly Office, Bratislava, Slovak Republic, July 12-13, 1993.

Reviewer and Contributor, Office of Technology Assessment reports: *Copyright and Home Copying*, 1989; *Global Standards*, 1992.

Panelist, *Pro & Con*, WHMM-TV, Washington, DC, Jul. 24, 1989.

Selection Committee, Rockefeller Prize for Non-Academically Affiliated Philosophers, American Philosophical Association, 1987, Chair, 1988.

Workshop on Ethics and Public Policy, Washington College, Summer 1980.

#### **Other Teaching Experience:**

Lecturer on Energy Efficiency and Dynamic Pricing, Institute for Public Utilities Advanced Regulatory Studies Program, Michigan State University, Oct. 1-2, 2009.

Lecturer on Natural Monopoly Regulation and Telecommunications Policy, State Committee on Demopolization and Competition Development, Tashkent, Uzbekistan, Jan. 14-18, 2005.

Lecturer, Post-Privatization: Managing the Challenge, International Law Institute, Washington, DC, Jun. 11, 2004, Oct. 14, 2005.

Lecturer, Georgetown Public Policy Institute, Georgetown University, Nov. 2003.

Lecturer, Microeconomics Refresher Course, World Bank, Washington, DC, 1999.

Lecturer, Economic Regulation, Washington Campus Summer MBA Program, Georgetown University, Washington, DC, 1996.

Lecturer, Regulatory Economics and Telecommunications Policy in Developing Market Economies, International Law Institute, Washington, DC, 1994.

Lecturer, United States Telecommunications Training Institute, Washington, DC, 1989-94.

Lecturer and Panelist, Annenberg Washington Program Communications Faculty Workshops, 1988-1990, 1993.

Lecturer, Introductory and Intermediate Microeconomics for Attorneys in the Antitrust Division, U. S. Dept. of Justice, Spring 1981-Spring 1982.

Teaching Assistant, Graduate Microeconomic Theory, University of Wisconsin, Madison, Spring 1977 ("Excellent" rating received).

Co-teacher, Institutional Economics, University of Wisconsin, Madison, Spring 1977.

Leader, Seminar on Nicholas Georgescu-Roegen's *The Entropy Law and the Economic Process*, University of Wisconsin, Madison, Summer 1977.

#### **Other Research Experience:**

Research Assistant in Education and Job Migration, Institute for Research on Poverty, University of Wisconsin, Madison, August 1975-August 1976.

Programmer and Research Assistant in Plasma Physics, Institute for Fluid Dynamics and Applied Mathematics, University of Maryland, College Park, October 1970-August 1974.

## **PUBLICATIONS**

#### **Books:**

*Alternating Currents: Electricity Markets and Public Policy* (with Karen Palmer and Salvador Martinez), Washington, DC: Resources for the Future (2002).

*A Shock to the System: Restructuring America's Electricity Industry* (with Karen Palmer, Raymond Kopp, Vito Stagliano, Alan Krupnick, and Dallas Burtraw), Washington: Resources for the Future (1996).

#### **Monographs:**

*The Supply Chain and Industrial Organization of Rare Earth Materials: Implications for the U.S. Wind Energy Sector* (with Jhih-Shyang Shih, Joshua Linn, Joel Darmstadter, Molly K. Macauley, and Louis Preonas), Washington: Resources for the Future (2012).

*Generating the Benefits of Competition: Challenges and Opportunities in Opening Electricity Markets*, Toronto: C. D. Howe Institute, Commentary 260 (April, 2008).

*The California Electricity Experience, 2000-2001: Education or Diversion?* Washington: Resources for the Future (2001).

#### **Edited Collections:**

*The Changing Postal and Delivery Sector: Towards a Renaissance* (co-edited with Michael Crew and Pier Luigi Parcu), New York: Springer (2017).

*The Future of the Postal Sector in a Digital World* (co-edited with Michael Crew), New York: Springer, (2016).

*Postal and Delivery Innovation in the Digital Economy* (co-edited with Michael Crew), New York: Springer (2015).

*The Role of the Postal and Delivery Sector in a Digital Age* (co-edited with Michael Crew) Cheltenham, UK: Edward Elgar (2014).

"Symposium: Recent Competition Issues in Telecommunications," *Antitrust Bulletin*, vol. 40, no. 3 (1995).

## Articles:

- “The Post-Internet Order Broadband Sector: Lessons from the Pre-Open Internet Order Experience,” *Review of Industrial Organization* (2016). doi:10.1007/s11151-016-9551-y .
- “Behavioral Economics and Energy-Efficiency Regulation,” *Network*, issue 59 (2016): 1-8.
- “Ahead of His Time: The Singular Contributions of Richard Markovits,” *Antitrust Bulletin*, vol. 61, no. 1 (2016): 109-20.
- “Holding Distribution Utilities Liable for Outage Costs,” *Energy Economics*, vol. 48, no. 1 (2015): 89-96.
- “Economics at the FCC, 2013-14,” (with Allison Baker, Jack Erb, Omar Nayeem, and Aleksandr Yankelevich), *Review of Industrial Organization*, vol. 45, no. 4 (2014): 345-78.
- “The Lost Virtue of Simplicity in Antitrust,” *Antitrust Bulletin*, vol. 59, no. 4 (2014): 827-53.
- “Behavioral Economics and Policy Evaluation,” *Journal of Benefit-Cost Analysis*, vol. 5, no. 1 (2014): 89-109.
- “Mitigating Monopoly or Preventing Discrimination: Comparing Antitrust to Regulatory Goals in the Interstate Commerce Act,” *Review of Industrial Organization* 43: (2013): 103-119.
- “Energy Efficiency Resource Standards: Economics and Policy” (with Karen Palmer), *Utilities Policy*, vol. 25 (2013): 58-68.
- “Putting a Floor on Energy Savings: Comparing State Energy Efficiency Resource Standards” (with Karen Palmer, Samuel Grausz, and Blair Beasley), *Utilities Policy* vol. 25 (2013): 43-57.
- “Energy Efficiency Policy Puzzles,” *Energy Journal*, vol. 34, no. 2 (2013): 1-25.
- “Should Utilities Be in the Energy Efficiency Business?” *IAEE Energy Forum* (Winter 2013): 9-14.
- “Prizes Versus Patents: A Comment on Jonathan Adler’s *Eyes on a Climate Prize: Rewarding Energy Innovation to Achieve Climate Stabilization*,” *Environmental Law Reporter News and Analysis* 42 (2012): 10719-10721.
- “Network Neutrality or Minimum Quality? Barking Up the Wrong Tree—and Finding the Right One,” *CPI Antitrust Chronicle* (March 2012 (2)): 2-9.
- “Getting Exclusion Cases Right: *Intel* and Beyond,” *CPI Antitrust Chronicle* (December 2011 (1)): 2-9.
- “Revise or Start Anew? Pondering the Google Books Rejection,” *CPI Antitrust Chronicle* (June 2011 (2)): 1-7.
- “‘High-Tech’ Antitrust: Incoherent, Misguided, Obsolete, or None of the Above? Comments on Crandall-Jackson and Wright,” *Review of Industrial Organization*, vol. 38, no. 4 (2011): 423-33.
- “Energy Efficiency and Renewables Policies: Promoting Efficiency or Facilitating Monopsony?” *Energy Policy*, vol. 39, no. 7 (2011): 3954-65.
- “The Challenges of Climate Policy,” *Australian Economic Review*, vol. 43, no. 3 (2010): 225–39.
- “Decoupling in Electric Utilities,” *Journal of Regulatory Economics*, vol. 38, no. 1 (2010): 49-69.
- “Optimal Energy Efficiency Policies and Regulatory Demand-Side Management Tests: How Well Do They Match?” *Energy Policy*, vol. 38 (2010): 3874-85.
- “Public-Private Co-Production of Risk: Government Indemnification of the Commercial Space Launch Industry” (with Carolyn Kousky and Molly Macauley), *Risk, Hazards & Crisis in Public Policy*, vol. 1, no. 1 (2010): 117-46, doi: 10.2202/1944-4079.1012.
- “Network Effects in Infrastructure Regulation: Principles and Paradoxes,” *Review of Network Economics*, vol. 8, no. 4 (2009): 279-301.
- “The Proposed Google Book Settlement: Assessing Exclusionary Effects,” *Global Competition Policy* (Oct. 2009, Release Two): 1-9.

- “Behavioral Economics and Merger Enforcement: A Speculative Guide,” *Threshold: American Bar Association Mergers and Acquisitions Committee*, vol. 9, no. 2 (2009): 21-29.
- “RPM as Exclusion: Did the U.S. Supreme Court Stumble Upon the Missing Theory of Harm?” *Antitrust Bulletin*, vol. 53, no. 4 (2008): 967-86.
- “Essential Facilities and *Trinko*: Should Antitrust and Regulation Be Combined?” *Federal Communications Law Journal*, vol. 61, no. 1 (2008): 133-47.
- “The Complement Market/Final Consumer Distinction: Exclusion & Predation in the U.S. Department of Justice Section 2 Report,” *Global Competition Policy* (Oct. 2008, Release One): 1-12.
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- “Conspiracy in Industry or Conspiracy in Academe? A Review of Yoshiro Miwa and J. Mark Ramseyer’s *The Fable of the Keiretsu: Urban Legends of the Japanese Economy*,” *International Journal of the Economics of Business*, vol. 15, no. 2 (2008): 265-78.
- “Applying ‘Merger Guidelines’ Market Definition to (De)Regulatory Policy: Pros and Cons,” *Telecommunications Policy*, vol. 32, no. 6 (2008): 388-398; doi: 10.1016/j.telpol.2008.04.003.
- “Skating Toward Deregulation: Canadian Developments,” *Federal Communications Law Journal*, vol. 60, n. 2 (2008): 325-57.
- “Bundled Rebates as Exclusion Rather Than Predation,” *Journal of Competition Law and Economics*, vol. 4: (2008): 335-374; doi: 10.1093/joclec/nhn001.
- “2006 in Competition Policy and Enforcement: An Economic Perspective” (with Alan Gunderson), *Canadian Competition Record*, vol. 22, no. 4 (Summer 2007): 67-93.
- “Consumer Preference Not to Choose: Methodological and Policy Implications,” *Energy Policy*, vol. 35 (2007): 1616-27.
- “Alleged Transmission Inadequacy: Is Restructuring the Cure or the Cause?” *Electricity Journal*, vol. 19, no. 4 (May 2006): 42-51.
- “Green Preferences as Regulatory Policy Instrument,” *Ecological Economics*, vol. 56, no. 1 (2006): 144-54.
- “Political Economy and the Efficiency of Compensation for Takings” (with James Boyd), *Contemporary Economic Policy*, vol. 24, no. 1 (2006): 188-202.
- “*Trinko* v. Baxter: The Demise of U.S. v. AT&T,” *Antitrust Bulletin*, vol. 50, no. 4 (2005): 635-64.
- “Should the Flamingo Fly? Using Competition Law to Limit the Scope of Postal Monopolies,” *Antitrust Bulletin*, vol. 50, no. 1 (2005): 197-221.
- “Vertical Market Power’ as Oxymoron: Horizontal Approaches to Vertical Antitrust,” *George Mason Law Review*, vol. 12, no. 4 (2004): 895-922.
- “Market Failures in Real-Time Metering,” *Journal of Regulatory Economics*, vol. 26, no. 2 (2004): 119-39.
- “The Legacy of *U.S. v. Microsoft*,” *Regulation*, vol. 26, no. 4 (Winter 2004): 22-28.
- “Electricity Capacity Requirements: Who Pays?” *Electricity Journal*, vol. 16, no. 8 (Oct. 2003): 11-22.
- “Mismeasuring Electricity Market Power,” *Regulation* 25 (Spring 2003): 60-65.
- “Do Easy Cases Make Bad Law? Antitrust Innovation or Missed Opportunities in *U.S. v. Microsoft*,” *George Washington Law Review*, vol. 69 (2001): 1042-1102.
- “Implementing Electricity Restructuring: Policies, Potholes, and Prospects” (with Karen Palmer and Salvador Martinez), *Environmental and Resource Economics*, vol. 22 (2002): 99-132.
- “The California Crisis: Questioning The Conventional ‘Wisdom’,” *Regulation* 24 (Fall 2001): 63-69.

- “Vertical Excuses for Horizontal Practices: Should There Be Any *Per Se* Rules?” *Antitrust Bulletin*, vol. 45 (2000): 467–490.
- “Programmi DSM e concorrenza elettrica negli Stati Uniti (DSM programs and electricity competition in the United States),” *Energia*, vol. 21, no. 1 (2000): 32–42.
- “The Spectrum as the Commons: Today’s Vision, Not Tomorrow’s Prescription,” *Journal of Law and Economics*, vol. 41 (1998): 791–803.
- “Industry Parallel Interconnection Agreements,” *Information Economics and Policy*, vol. 9 (1997): 133–149.
- “Technology and Coordination: Antitrust Implications of Remote Sensing Satellites,” (with Molly Macauley), *Antitrust Bulletin*, vol. 42 (1997): 477–502.
- “Stranded Costs, Takings, and the Law and Economics of Implicit Contracts,” (with James Boyd), *Journal of Regulatory Economics*, vol. 11 (1997): 41–54.
- “Making Sense of the Telecommunications Act of 1996,” *Industrial and Corporate Change*, vol. 5 (1996): 941–61.
- “Methodology—Abstract Philosophy or Criticism of Diminishing Returns,” *Research in the History of Economic Thought and Methodology*, vol. 14 (1996): 329–42.
- “Is Cost-of-Service Regulation Worth The Cost?” *International Journal of the Economics of Business*, vol. 3, no. 1 (1996): 25–42.
- “Remote Sensing Satellites and Privacy: A Framework for Policy Assessment” (with Molly Macauley), *Journal of Law, Computers, and Artificial Intelligence*, vol. 4, no. 3 (1995): 233–48.
- “Does the Theory Behind *U.S. v. AT&T* Still Apply Today?” *Antitrust Bulletin*, vol. 40, no. 3 (1995): 455–82, reprinted in Brock, Gerald and Gregory Rosston (ed.), *The Internet and Telecommunications Policy: Selected Papers from the 1995 Telecommunications Policy Research Conference* (New York: Lawrence Erlbaum, 1996).
- “Markets, Information, and Benevolence,” *Economics and Philosophy*, vol. 10, no. 2 (1994): 151–68.
- “Talking to One’s Selves: The Social Science of Jon Elster,” *Journal of Communication*, vol. 44, no. 1 (1994): 73–81.
- “Economic Theory in Industrial Policy: Lessons From *U.S. v. AT&T*,” *Research in the History of Economic Thought and Methodology*, vol. 11 (1994): 49–72.
- “Comparing the Costs and Benefits of Diversification by Regulated Firms” (with Karen Palmer), *Journal of Regulatory Economics*, vol. 6, no. 2 (1994): 115–36.
- “Copyright, Property, and the Right to Deny,” *Chicago-Kent Law Review*, vol. 68, no. 2 (1993): 675–714.
- “The Futility of Multiple Utility,” *Economics and Philosophy*, vol. 9, no. 1 (1993): 155–64.
- “Content, Controversy, and Control: Politics and the Evolution of Antitrust Enforcement,” *Law and Policy*, vol. 14, no. 1 (1992): 107–22.
- “Refusing to Cooperate with Competitors: A Theory of Boycotts,” *Journal of Law and Economics*, vol. 35, no. 2 (1992): 247–64.
- “Integrating Communications Theory into Media Policy: An Economic Perspective,” *Telecommunications Policy*, vol. 16, no. 6 (1992): 460–74 (nominated for the Donald McGannon Communication Research Center 1993 Communication Policy Research Award).
- “Rational Ignorance: The Strategic Economics of Military Censorship,” *Southern Economic Journal*, vol. 58, no. 4 (1992): 966–74.
- “Depreciation, Investor Compensation, and Welfare under Rate-of-Return Regulation,” *Review of Industrial Organization*, vol. 6, no. 1 (1991): 73–87.

- “Voluntary Exchange and Economic Claims,” *Research in the History of Economic Thought and Methodology*, vol. 7 (1990): 105-24.
- “Vertical Integration, Monopoly, and the First Amendment,” *Journal of Media Economics*, vol. 3, no. 1 (1990): 57-76.
- “Cross-Subsidization and Cost Misallocation by Regulated Monopolists,” *Journal of Regulatory Economics*, vol. 2, no. 1 (1990): 37-51.
- “Understanding ‘Raising Rivals’ Costs’: Reply,” *Antitrust Bulletin*, vol. 34, no. 4 (1989): 909-18.
- “A Methodological Assessment of Multiple Utility Frameworks,” *Economics and Philosophy*, vol. 5, no. 2 (1989): 189-208, reprinted in Caldwell, Bruce (ed.), *The Philosophy and Methodology of Economics* (Aldershot: Edward Elgar, 1993): vol. 1, 405-24.
- “The ‘Fairness Doctrine’ as Public Policy,” *Journal of Broadcasting and Electronic Media*, vol. 33, no. 4 (1989): 419-40.
- “Exclusive Dealing, Limiting Outside Activity, and Conflict of Interest,” *Southern Economic Journal*, vol. 56, no. 2 (1989): 323-35.
- “Divestiture Policy Considerations in an Information Services World,” *Telecommunications Policy*, vol. 13, no. 3 (1989): 243-54.
- “Regulating by ‘Capping’ Prices,” *Journal of Regulatory Economics*, vol. 1, no. 2 (1989): 133-47, reprinted in Einhorn, Michael (ed.), *Price Caps and Incentive Regulation in Telecommunications* (Norwell, MA: Kluwer Academic Press, 1991): 33-45.
- “Exclusive Dealing in General Business Practice,” *Journal of Business Strategies*, vol. 5, no. 2 (1988): 53-60.
- “Understanding Raising Rivals’ Costs,” *Antitrust Bulletin*, vol. 33, no. 1 (1988): 95-113.
- “An Economic Look at Taxing Home Audio Taping” *Journal of Broadcasting and Electronic Media*, vol. 32, no. 1 (1988): 89-103.
- “Rights, Market Failure, and Rent Control: A Comment on Radin,” *Philosophy and Public Affairs*, vol. 17, no. 1 (1988): 66-79.
- “Academic Disciplines and Representative Advocacy,” *Business and Professional Ethics Journal*, vol. 6, no. 1 (1987): 32-55.
- “Why Regulated Firms Should Be Kept Out Of Unregulated Markets: Understanding the Divestiture in *U.S. v. AT&T*,” *Antitrust Bulletin*, vol. 32, no. 3 (1987): 741-93.
- “Joint Production and Monopoly Extension Through Tying” (with Sheldon Kimmel), *Southern Economic Journal*, vol. 53, no. 2 (1986): 490-501.
- “Harper & Row v. *The Nation*: Copyrightability and Fair Use,” *Journal of the Copyright Society of the U.S.A.*, vol. 33, no. 4 (1986): 368-89.
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- “Local Government Action and Antitrust Policy: An Economic Analysis,” *Fordham Urban Law Journal*, vol. 12, no. 3 (1984): 405-36.
- “Economic Efficiency and Broadcast Content Regulation,” *Federal Communications Law Journal*, vol. 35, no. 2 (1983): 117-38.
- “Mistaken Elasticities and Misleading Rules,” *Harvard Law Review*, vol. 95, no. 8 (1982): 1849-56, excerpted in Calvani, Terry, and John Siegfried (eds.), *Economic Analysis and Antitrust Law* (Boston: Little Brown, 1988): 118-22.
- “Explanation and Value in Economics,” *Journal of Economic Issues*, vol. 13, no. 4 (1979): 911-32.

## Chapters in Books:

- “The Postal Accountability and Enhancement Act After 10 Years: Some Proposals for Reform” (with Michael Crew), in Brennan, Timothy, Michael Crew and Pier Luigi Parcu (eds.), in *The Changing Postal and Delivery Sector: Towards a Renaissance* (New York: Springer, 2017): 1-15.
- “Price Cap Regulation and Declining Demand,” (with Michael Crew) in Crew, Michael and Timothy Brennan (eds.), *The Future of the Postal Sector in a Digital World* (New York: Springer, 2016): 1-17.
- “Business Models: Some Implications for USPS,” (with Michael Crew), in Crew, Michael and Timothy Brennan (eds.), *Postal and Delivery Innovation in the Digital Economy* (New York, Springer, 2015): 1-15.
- “An Expanded Distribution Utility Business Model: Win-Win, or Win-Maybe?,” in Fereidoon P. Sioshansi (ed.), *Distributed Generation and its Implications for the Utility Industry* (Waltham, MA: Academic Press, 2014) 251-65.
- “Gross Substitutes vs. Marginal Substitutes: Implications for Market Definition in the Postal Sector” (with Michael Crew) in Crew, Michael and Timothy Brennan (eds.), *The Role of the Postal and Delivery Sector in a Digital Age* (Cheltenham, UK: Edward Elgar, 2014): 1-15.
- “Commentary: Economic Regulation of Utility Infrastructure,” in Ingram, Gregory and Karin Brandt (eds.), *Infrastructure and Land Policies* (Cambridge, MA: Lincoln Institute of Land Policy, 2013): 123-25.
- “Valuing Information, Ascertaining Risk, and Setting the Target,” in Macauley, Molly and Ramanan Laxminarayan (eds.), *The Value of Information: Methodological Frontiers and New Applications in Environment and Health* (New York: Springer, 2012): 31-43.
- “Net Neutrality or Minimum Standards: Network Effects vs. Market Power Justifications,” in Spiecker, Indra and Jan Krämer (eds.), *Network Neutrality and Open Access* (Baden-Baden: Nomos Publishers, 2011): 61-78.
- “Copyright, Property, and the Right to Deny,” in May, Christopher (ed.), *The Political Economy of Intellectual Property 2* (Northampton, MA: Edward Elgar, 2010), chapter 16, reproduced from *Chicago-Kent Law Review*, vol. 68, no. 2 (1993): 675-714.
- “Assessing Electricity Markets: Prospects and Pitfalls,” in Parry, Ian W.H. and Felicia Day (eds.), *Issues of the Day* (Washington: Resources for the Future, 2010): 70-71.
- “The Changing Antitrust/Regulation Interface in the US: Railways and Beyond,” in Wills-Johnson, Nick (ed.), *The Business of Australia's Railways: Proceedings from the Australian Railways Business and Economics* (Perth, Australia: Curtin University Centre for Research into Applied Economics, 2009): 8-22.
- “Commentary: Bright Lines and Cautionary Notes,” in Boyer, Marcel, David Faver and Michael Trebilcock, *Competition Policy and Intellectual Property* (Toronto: Irwin Law, 2009): 226-45.
- “Should Innovation Rationalize Supra-Competitive Prices? A Skeptical Speculation,” in Fredenberg, Arvid (ed.), *The Pros and Cons of High Prices* (Stockholm: Konkurrensverket/Swedish Competition Authority, 2007): 88-127.
- “Saving Section 2: Reframing U.S. Monopolization Law,” in Ghosal, Vivek and Johan Stennek (eds.), *The Political Economy of Antitrust* (Amsterdam: North-Holland, 2007): 417-51.
- “Preventing Monopoly or Discouraging Competition? The Perils of Price-Cost Tests for Market Power in Electricity,” in Kleit, Andrew N. (ed.), *Electric Choices: Deregulation and the Future of Electric Power* (Lanham, MD: Rowman and Littlefield, 2006): 163-79.
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- “The FCC and Policy Federalism: Broadband Internet Access Regulation,” in Madden, Gary and Scott Savage (eds.), *International Handbook of Telecommunications Economics, Volume III* (Northampton, MA: Edward Elgar, 2003): 173-99.
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- “Is the Open Internet Order an ‘Economics-Free Zone’?” Free State Foundation, vol. 29, no. 22, (Jun. 28, 2016).
- “Data From Drones: A New Way to See the Natural World” (with Molly Macauley), *Resources* No. 192: 40-45 (Spring 2016).
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- Review of *Digital Crossroads: Telecommunications Law and Policy in the Internet Age* by Jonathan E. Nuechterlein and Philip J. Weiser, *Choice* (March 2014).
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## Reports and Institutional Publications

- “How Much Relevance Does Reality Imply? (Re)Considering the Endowment Effect, Resources for the Future Discussion Paper 16-31 (July 2016).
- “Holding Distribution Utilities Liable for Outage Costs: An Economic Look,” Resources for the Future Discussion Paper 13-16 (July 2013).
- “Putting a Floor on Energy Savings: Comparing State Energy Efficiency Resource Standards” (with Karen Palmer, Samuel Grausz and Blair Beasley), Resources for the Future Discussion Paper 12-11 (February 2012).
- “Energy Efficiency Resource Standards: Economics and Policy” (with Karen Palmer), Resources for the Future Discussion Paper 12-10 (February 2012).
- “Energy Efficiency Policy: Surveying the Puzzles,” Resources for the Future Discussion Paper 11-27 (May 2011).
- “Prizes, Patents and Technology Procurement: A Proposed Analytical Framework” (with Molly Macauley and Kate Whitefoot), RFF Discussion Paper 11-21 (May 2011 Resources for the Future.

- “Net Neutrality or Minimum Quality Standards: Network Effects vs. Market Power Justifications,” (June 8, 2010), available at SSRN: <http://ssrn.com/abstract=1622226>.
- “More than a Wing and a Prayer: Government Indemnification of the Commercial Space Launch Industry” (with Carolyn Kousky and Molly Macauley), Resources for the Future Discussion Paper 09-38 (September 2009).
- “The Challenges of Climate for Energy Markets,” Resources for the Future Discussion Paper 09-32 (September 2009).
- “Network Effects as Infrastructure Challenges Facing Utilities and Regulators,” ACCC Regulatory Conference, Conference papers/presentations, Session 1 (July 2009).
- “Energy Efficiency: Efficiency or Monopsony?” Resources for the Future Discussion Paper 09-20 (May 2009).
- “Optimal Energy Efficiency Policies and Regulatory Demand-Side Management Tests: How Well Do They Match?” Resources for the Future Discussion Paper 08-46 (January 2009).
- “Is the Benefit of Reserve Requirements in the ‘Reserve’ or the ‘Requirement?’” Resources for the Future Discussion Paper 08-33 (September 2008).
- “‘Night of the Living Dead’ or ‘Back to the Future?’ Electric Utility Decoupling, Reviving Rate-of-Return Regulation, and Energy Efficiency,” Resources for the Future Discussion Paper 08-27 (August 2008).
- “Electricity Markets and Energy Security: Friends or Foes,” Resources for the Future Discussion Paper 07-46 (2007).
- “Saving Section 2: Reframing Monopolization Law,” AEI-Brookings Joint Center for Regulatory Studies Related Publication 05-27 (2005).
- “Competition as an Entry Barrier? Consumer and Total Welfare Effects of Bundling,” AEI-Brookings Joint Center for Regulatory Studies Related Publication 05-08 (2005).
- “State and Federal Roles in Facilitating Electricity Competition: Legal and Economic Perspectives in the Electricity Sector,” Harvard Electricity Policy Group, Kennedy School of Government, Harvard University (2004).
- “Do Easy Cases Make Bad Law? Antitrust Innovations or Missed Opportunities in *United States v. Microsoft*,” AEI-Brookings Joint Center for Regulatory Studies Related Publication (2002).
- “Checking for Market Power in Electricity: The Perils of Price-Cost Margins,” Institute for Policy Analysis (Melbourne, VIC, Australia), (2002).
- “Vertical Market Power” as Oxymoron: Getting Convergence Mergers Right,” Resources for the Future Discussion Paper 01-39 (2001).
- “The Economics of Competition Policy: Recent Developments and Cautionary Notes in Antitrust and Regulation,” Resources for the Future Discussion Paper 00-07 (2000).
- “Do Lower Prices for Polluting Goods Make Environmental Externalities Worse?” Resources for the Future Discussion Paper 99-40 (1999).
- “Demand-Side Management Programs Under Retail Electricity Competition,” Resources for the Future Discussion Paper 99-02 (1998).
- “Transforming Power Markets: The Clinton Administration’s ‘Comprehensive Electricity Comprehension Plan,’” Resources for the Future, (1998).
- “Enforcing Environmental Regulation: Implications of Remote Sensing Technology,” (with Molly K. Macauley), Resources for the Future Discussion Paper 98-33 (1998).
- “Making Sense of the Telecommunications Act of 1996,” Center for Research on Telecommunications Policy Working Paper CRTP-34, Haas School of Business, University of California, Berkeley (1996).

- “Is Cost-of-Service Regulation Worth the Cost?” Economic Analysis Group Discussion Paper 93-9, Antitrust Division, U.S. Dept. of Justice (1993).
- “Market Failure and Public Policy Toward Telecommunications Infrastructures,” Office of Technology Assessment, Washington, DC (1993).
- “Moral Rights, Public Policy Debate, and Right Holder Inalienability,” Graduate Institute for Policy Education and Research Working Paper 1988-6, George Washington University (1988).
- “Capping ‘Average’ Prices of Regulated Multiproduct Firms,” Department of Economics, Economics Discussion Paper D-8718, George Washington University, (1987).
- “The ‘Fairness Doctrine’ in Broadcasting: Philosophical and Economic Perspectives,” Economics Discussion Paper D-8709, Department of Economics, George Washington University (1987).
- “Cross-Subsidization and Discrimination by Regulated Monopolists,” Economic Analysis Group Discussion Paper 87-2, Antitrust Division, U.S. Dept. of Justice (1987) [presented, Southern Economic Association meetings, Nov. 23, 1987].
- “Liability Rules and Quality Choice: Are There Too Many BMWs on The Road?” Economics Discussion Paper D-8704, Department of Economics, George Washington University (1987).
- “Taxing Home Audio Taping,” Economic Analysis Group Discussion Paper 86-6, Antitrust Division, U.S. Dept. of Justice (1986).

## SELECTED PRESENTATIONS

### 2011 – Present:

- “NARUC vs. NYPSC,” Advanced Workshop in Regulation and Competition, Center for Research in Regulated Industries, Rutgers Business School, Newark, NJ (Nov. 18, 2016).
- “Competitive Electricity Pricing and Power Market Reform,” Energy System Transformation Workshop 2016: Toward a Sustainable and Healthy Energy System in China, Rock Environment and Energy Institute, Beijing, China (via video) (October 20, 2016).
- “Merger Conditions,” Rutgers University Center for Research in Regulated Industries, 35<sup>th</sup> Eastern Conference in Advanced Regulatory Economics, Shawnee-on-Delaware, PA (May 11, 2016); Rutgers University Center for Research in Regulated Industries, 29<sup>th</sup> Western Conference in Advanced Regulatory Economics, Monterey, CA (Jun. 22, 2016).
- “How Much Relevance Does Reality Imply? (Re)Considering the Endowment Effect,” Society for Benefit Cost Analysis 8<sup>th</sup> Annual Conference, Washington, DC (Mar. 18, 2016); Canadian Economic Association Meetings, Ottawa, ON, CA (Jun. 4, 2016).
- “The 2015 Open Internet Order: Administrative Law Questions,” Center for Research in Regulated Industries, Rutgers Business School, Newark, NJ (Jan. 15, 2016).
- “The Post-Internet Order Broadband Sector: Lessons from the Pre-Open Internet Order Experience,” Symposium: The Future of the Internet Ecosystem in a Post-Open Internet Order World, Technology Policy Institute and the University of Pennsylvania Law School’s Center for Technology, Innovation and Competition, Washington, DC (Jan. 8, 2016); Rutgers University Center for Research in Regulated Industries, 34<sup>th</sup> Eastern Conference in Advanced Regulatory Economics, Shawnee-on-Delaware, PA (May 12, 2016); Advanced Analytical Consulting Group (webinar, Sep. 7, 2016)..
- “Ahead of His Time: The Singular Contributions of Richard Markovits,” University of Texas Law School, Austin, TX (Oct. 16, 2015).
- “Government Policy and 5G Innovation,” The Innovation and Engineering Dynamics of the Digital Economy: Economic Transformation and Expansion Enabled by 5G, Georgetown Center for Business and Public Policy, Georgetown University, Washington, DC (Oct. 14, 2015).

- “Current U.S. Regulatory Issues,” ACCC/AER Regulation Conference 2015, Brisbane, QLD, Australia (Aug. 6, 2015).
- “Opening the ‘Open Internet,” Rutgers University Center for Research in Regulated Industries, 34<sup>th</sup> Eastern Conference in Advanced Regulatory Economics, Shawnee-on-Delaware, PA (May 13, 2015); FSR Communication and Media Annual Conference, Florence School of Regulation, Florence, Italy (May 29, 2015); Resources for the Future, Washington, DC (June 11, 2015); Rutgers University Center for Research in Regulated Industries, 28<sup>th</sup> Western Conference in Advanced Regulatory Economics, Monterey, CA (June 24, 2015); ACCC/AER Regulation Conference 2015, Brisbane, QLD, Australia (Aug. 6, 2015); ACCC Legal and Economic Section, Melbourne, VIC, Australia (Aug. 11, 2015); University of Maryland, Baltimore County, Catonsville, MD (Sep. 24, 2015); Economic Analysis Group, Antitrust Division, U.S. Department of Justice, Washington, DC (Nov. 10, 2015).
- “Storage Market and Policy Issues,” Storage, Renewables and the Evolution of the Grid Symposium, MIT Energy Initiative, Cambridge, MA (May 1, 2015).
- “Policy Aspects of Time-Variant Pricing (TVP) of Electricity,” On the REV Agenda: The Role of Time-Variant Pricing, New York Department of Public Service, Environmental Defense Fund and Institute for Policy Integrity—NYU School of Law, New York, NY (Mar. 31, 2015).
- “Price Cap Regulation with Declining Demand,” CRRI/Rutgers: Prospects for Reforming the Postal Sector, Washington, DC (Mar. 27, 2015); Rutgers University Center for Research in Regulated Industries, 34<sup>th</sup> Eastern Conference in Advanced Regulatory Economics, Shawnee-on-Delaware, PA (May 15, 2015); Rutgers University Center for Research in Regulated Industries, 28<sup>th</sup> Western Conference in Advanced Regulatory Economics, Monterey, CA (June 25, 2015).
- “Does Benefit-Cost Analysis Solve the Right Problem?” Society for Benefit-Cost Analysis Seventh Annual Conference, Washington, DC (March 19, 2015).
- Panel discussion on the economics of bargaining, DC Industrial Organization Conference 2015, Washington, DC (Mar. 6, 2015).
- “Bidding for Spectrum: The Absence of a ‘Foreclosure Premium,” Center for Research in Regulated Industries, Rutgers Business School, Newark, NJ (Jan. 16, 2015); Rutgers University Center for Research in Regulated Industries, 34<sup>th</sup> Eastern Conference in Advanced Regulatory Economics, Shawnee-on-Delaware, PA (May 14, 2015).
- “Is Behavioral Economics ‘Economics?’” Office of Planning, U.S. Food and Drug Administration, White Oak, MD (Oct. 1, 2014); Department of Economics, Emory University, Atlanta, GA (Oct. 9, 2014).
- “Economic Observations on Cybersecurity Policy,” Workshop on the Economics of Information Security, Department of Homeland Security and Penn State University, State College, PA (Jun. 25<sup>th</sup>, 2014).
- “Exclusion via Conditional Pricing: Keeping it Simple,” Federal Trade Commission/Department of Justice Workshop on Conditional Pricing Practices, Washington, DC (Jun. 23<sup>rd</sup>, 2014).
- Keynote, “A Regulator’s Dilemma: Policy in an Age of Disruption,” Center for Business and Public Policy, Georgetown University, Washington, DC (Jun. 17<sup>th</sup>, 2014).
- “Energy Efficiency Policy: Does it conserve? Who makes the choices? Can winners compensate losers”, Science, Technology and Environmental Policy Program, Woodrow Wilson School, Princeton University, Princeton, NJ (Mar. 24, 2014).
- “Ethical Rights in Policy Assessment: The Role and Necessity of Inalienability,” Society for Benefit-Cost Analysis, Sixth Annual Conference, Washington, DC (March 13, 2014).
- “The FCC: From ‘Regulatory Agency’ to ‘Granting Agency?’” National Exchange Carrier Association NECA EXPO, Academic Perspective on Regulatory Reform, Las Vegas, NV (Nov. 13, 2013).
- “An Expanded Distribution Utility Business Model: Win-Win, or Win-Maybe,” Trans-Atlantic Infraday, Federal Energy Regulatory Commission, Washington, DC (Nov. 8, 2013), Center for Research in Regu-

- lated Industries, Rutgers Business School, Newark, NJ (Jan. 8, 2014), Rutgers University Center for Research in Regulated Industries, 33<sup>rd</sup> Eastern Conference in Advanced Regulatory Economics, Shawnee-on-Delaware, PA (May 16, 2014).
- “Using Executive Orders or Legislation for Clean Energy Policy: Framing the Question,” Workshop on Accelerating Deployment of Clean Energy Technologies, National Academy of Sciences, Washington, DC (Jul. 26, 2013).
- “‘Economics of Law’ Insights into Cybersecurity Policy,” The Incentives and Regulation of Cybersecurity, Center for Business and Public Policy, Georgetown University, Washington, DC (Jun. 13, 2013).
- “Complexity in Antitrust: The Accuracy-Simplicity Tradeoff,” Antitrust as an Interdisciplinary Field: Insights from Economics and Business Strategy, American Antitrust Institute 2013 Symposium, Washington, DC (Jun. 11, 2013).
- “Gross Substitutes vs. Marginal Substitutes: Implications for Market Definition in the Postal Sector,” CRRRI Workshop in Regulatory Economics: The Future of USPS, Washington, DC (Apr. 12, 2013); 21<sup>st</sup> Conference on Postal and Delivery Economics, Portmarnock, County Fingal, Ireland (Jun. 1, 2013); Federal Communications Commission, Washington, DC (Jul. 9, 2013).
- “Energy Efficiency Policy: The Role of Consumer Error,” 40<sup>th</sup> Annual PURC Conference, Public Utility Research Center, Warrington College of Business Administration, University of Florida, Gainesville, FL (Feb. 13, 2013); Center for Research in Regulated Industries, Rutgers Business School, Newark, NJ (Jan. 8, 2014).
- “Whither the FCC?” Phoenix Center for Advanced Legal and Economic Policy Studies, 2013 Annual U.S. Telecoms Symposium, Washington, DC (Jan. 3, 2013).
- “Holding Distribution Utilities Liable for Outage Costs: An Economic Look,” National Association of State Utility Consumer Advocates, Baltimore, MD (Nov. 12, 2012); Center for Research in Regulated Industries, Rutgers Business School, Newark, NJ (Nov. 16, 2012); Rutgers University Center for Research in Regulated Industries, 32<sup>nd</sup> Eastern Conference in Advanced Regulatory Economics, Shawnee-on-Delaware, PA (May 16, 2013); 11<sup>th</sup> International Industrial Organization Conference, Boston, MA (May 18, 2013).
- “Behavioral Economics and Policy Evaluation,” Association for Public Policy Analysis and Management, Baltimore, MD (Nov. 9, 2012); Society for Benefit-Cost Analysis (Feb. 21, 2013).
- “Transmission Investment Issues in the US (with possible application to New Zealand),” Transpower NZ Limited, Wellington, NZ (Jul. 30, 2012).
- “Government Business Enterprises or Regulated Private Firms: Issues in Choice, Interaction, and Implementation,” 13<sup>th</sup> Australian Competition and Consumer Commission Regulatory Conference: Lessons Learned and New Approaches, Brisbane, QLD, Australia (Jul. 26, 2012).
- “Lessons For (De)Regulatory Economics: Failures and Controversies,” 13<sup>th</sup> Australian Competition and Consumer Commission Regulatory Conference: Lessons Learned and New Approaches, Brisbane, QLD, Australia (Jul. 24, 2012); Webb Henderson Regulatory Roundtable, Wellington, NZ (Jul. 30, 2012).
- “Regulating Infrastructure Service: Multiple Objectives, Economic and Other,” 7<sup>th</sup> Annual Land Policy Conference: Infrastructure and Land Policies, Lincoln Institute, Cambridge, MA (Jun. 4, 2012).
- “Clean Energy Standard Proposals,” 1<sup>st</sup> Northeast Workshop on Energy Policy and Environmental Economics, Dyson School of Applied Economics and Management, Cornell University, Ithaca, NY (May 5, 2012).
- “What Policy Goals Should Count in Antitrust? Musings on AT&T/T-Mobile,” Phoenix Center for Advanced Legal and Economic Policy Studies, 2011 Annual U.S. Telecoms Symposium, Washington, DC (Dec. 1, 2011).



- “Energy Efficiency Resource Standards: Economics and Policy,” 5<sup>th</sup> Annual Trans-Atlantic InfraDay—Atlantic Energy Group conference, Federal Energy Regulatory Commission, Washington, DC (Nov. 10, 2011); 10<sup>th</sup> International Industrial Organization Conference, Arlington, VA (Mar. 17, 2012); Rutgers University Center for Research in Regulated Industries, 31<sup>st</sup> Eastern Conference in Advanced Regulatory Economics, Shawnee-on-Delaware, PA (May 17, 2012).
- “Patents, Prizes and Technology Procurement: A Proposed Analytical Framework,” 9<sup>th</sup> International Industrial Organization Conference, Boston, MA (Apr. 9, 2011); National Academy of Sciences, Washington, DC (Mar. 8, 2012); Environmental Law and Policy Annual Review Conference, Washington, DC (Apr. 13, 2012).
- “Can the Future Compensate the Present? Potential Limitations on Cost-Benefit Analysis in Climate Policy,” Society for Benefit-Cost Analysis, Third Annual Conference and Meeting, Washington, DC (Oct. 20, 2010); Center for Urban Environmental Research and Education, UMBC, Catonsville, MD (Apr. 1, 2011), Resources for the Future, Washington, DC (Jun. 29, 2011); Institute of Public Affairs, Melbourne, VIC, Australia (Jul. 23, 2012).
- “Energy Efficiency: Policy Puzzles,” Institute for Public Utilities Advanced Regulatory Studies Program, Michigan State University, East Lansing, MI (Oct. 1, 2009); Robert F. Lanzillotti Public Policy Research Center, Warrington College of Business Administration, University of Florida, Gainesville, FL (Mar. 18, 2010), 4<sup>th</sup> Trans-Atlantic InfraDay, Washington, DC (Nov. 5, 2010); 9<sup>th</sup> International Industrial Organization Conference, Boston, MA (Apr. 10, 2011); Rutgers University Center for Research in Regulated Industries, 30<sup>th</sup> Eastern Conference in Advanced Regulatory Economics, Skytop, PA (May 20, 2011); 45<sup>th</sup> Meeting of the Canadian Economic Association, Ottawa, ON, Canada (Jun. 3, 2011); Government Accountability Office, Washington, DC (Oct. 4, 2011); U.S. Association for Energy Economics, 30<sup>th</sup> North American Conference, Washington, DC (Oct. 12, 2011).
- “The Challenges of Climate for Energy Markets,” Australian Competition and Consumer Commission, Tenth Regulatory Conference, Surfers’ Paradise, Queensland, Australia (July 30, 2009); Maryland Clean Energy Technology Incubator, Catonsville, MD (Mar. 10, 2010), Rutgers University Center for Research in Regulated Industries, 29<sup>th</sup> Eastern Conference in Advanced Regulatory Economics, Skytop, PA (May 20, 2010); University of California-Washington Center, Washington, DC (Sep. 15, 2011).
- “Behavioral vs. standard economics: A methodological assessment,” Curtin Corner Public Policy Forum, Curtin Graduate School of Business, Perth, WA, Australia (July 24, 2009); UMBC Department of Public Policy, Baltimore, MD (Dec. 9, 2009); Association for Social Economics, Philadelphia, PA (Feb. 28, 2010); Resources for the Future, Washington, DC (Jun. 10, 2010); Canadian Competition Bureau, Gatineau, QC (Jun. 2, 2011), Economic Analysis Group, Antitrust Division, U.S. Department of Justice, Washington, DC (Mar. 27, 2012); Australian Competition and Consumer Commission, Melbourne, VIC, Australia (Jul. 24, 2012); Department of Economics, West Virginia University, Morgantown, WV (Oct. 5, 2012).

#### **2006 – 2010:**

- “Today’s Top Ten Telecom Policy List,” Phoenix Center for Advanced Legal and Economic Policy Studies, 2010 Annual U.S. Telecoms Symposium, Washington, DC (Dec. 2, 2010).
- “Consumer Choice in Electricity: Empirical Causes and Methodological Implications,” 3<sup>rd</sup> Annual FTC-Northwestern Microeconomics Conference, Federal Trade Commission, Washington, DC (Nov. 18, 2010).
- “‘High Tech’ Antitrust: Incoherent, Misguided, Obsolete, or None of the Above?” Antitrust and the Dynamics of Competition in High Tech Industries, Technology Policy Institute, Washington, DC (Oct. 22, 2010).
- “Valuing Information, Ascertaining Risk, and Setting the Target,” The Value of Information: Methodological Frontiers and New Applications, Resources for the Future and Center for Disease Dynamics, Economics and Policy, Washington, DC (Jun. 28, 2010).

- “Net Neutrality or Minimum Standards: Network Effects vs. Market Power Justifications,” Rutgers University Center for Research in Regulated Industries, 29<sup>th</sup> Eastern Conference in Advanced Regulatory Economics, Skytop, PA (May 20, 2010); Ball State University Digital Policy Institute, Indianapolis, IN (Oct. 15, 2010); 32<sup>nd</sup> Annual Association for Public Policy Analysis and Management Research Conference, Boston, MA (Nov. 4, 2010); Network Neutrality and Open Access, 2nd International Symposium on Communications Regulation, Karlsruhe Institute of Technology Institute of Information Systems and Management, Karlsruhe, Germany (Nov. 22, 2010).
- “Energy Policy and Entrepreneurship,” Grand Opening, Maryland Clean Energy Technology Incubator, Baltimore, MD (Mar. 30, 2010).
- “Dynamic Pricing,” Institute for Public Utilities Advanced Regulatory Studies Program, Michigan State University, East Lansing, MI (Oct. 1, 2009).
- “Network Effects as Infrastructure Challenges Facing Utilities and Regulators,” Keynote Address, Australian Competition and Consumer Commission, Tenth Regulatory Conference, Surfers’ Paradise, Queensland, Australia (July 30, 2009); Trans-Atlantic INFRADAY Conference on Applied Infrastructure Modeling and Policy Analysis, Washington, DC (Nov. 13, 2009).
- “Opening Electricity Markets: US Expectations, Realities,” Energy Forum, Institute for Policy Analysis, Melbourne, VIC, Australia (July 28, 2009); Regulatory Roundtable, MGF Webb, Auckland, NZ (Aug. 3, 2009); Greater Baltimore Committee Energy Symposium, Baltimore, MD (Dec. 9, 2009).
- “Exclusion vs. Predation: Drawing Lines Between Easy and Hard Abuse Cases,” Australian Competition and Consumer Commission, Melbourne, VIC, Australia (July 27, 2009); Economic Analysis Group, Antitrust Division, U.S. Department of Justice, Washington, DC (Mar. 16, 2010); Bureau of Economics, Federal Trade Commission, Washington, DC (Apr. 8, 2010); Sixth Biennial Meeting, Hong Kong Economics Association, Nankai University, Tianjin, China (Dec. 19, 2010).
- “The Changing Antitrust/Regulation Interface in the US: Railways and Beyond,” Australian Railway Business Economics Conference, Centre for Research in Applied Economics, Curtin Graduate School of Business, Perth, WA, Australia (July, 20, 2009).
- “Climate Change, Cap-and-Trade, Renewable Electricity and Efficiency Mandates: How Do They Fit Together?” Technology Policy Institute, Rayburn House Office Building, Washington, DC (June 12, 2009).
- “Economic Standards for Considering Abuse of Dominance: Canadian and U.S. Perspectives,” (co-panelist), Canadian Bar Association, National Competition Law Section, Economics Committee and American Bar Association, Section of Antitrust Law, Economics Committee and International Committee (via teleconference, May 27, 2009).
- “Supporting the Infrastructure: Has Deregulation Helped or Hurt?” *Electric Power Infrastructure: Status and Challenges for the Future*, 2009 Annual Energy Conference, Energy Information Administration, U.S. Department of Energy, Washington, DC (Apr. 7, 2009); Rutgers University Center for Research in Regulated Industries, 28<sup>th</sup> Eastern Conference in Advanced Regulatory Economics, Skytop, PA (May 15, 2009).
- “Energy Efficiency: Efficiency or Monopsony?” 7<sup>th</sup> International Industrial Organization Conference, Boston, MA (Apr. 5, 2009); Rutgers University Center for Research in Regulated Industries, 22<sup>nd</sup> Western Conference in Advanced Regulatory Economics, Monterey, CA (Jun. 18, 2009), 44<sup>th</sup> Meeting of the Canadian Economic Association, Quebec City, QC, Canada (May 30, 2010).
- “Theories of Harm From RPM: Exclusion, the Equivalence Principle, and *per se* Rules,” FTC Hearings on Resale Price Maintenance, Panel 2: Examining Theories of Harm from Resale Price Maintenance, Federal Trade Commission, Washington, DC (Feb. 19, 2009).
- “Decoupling,” Michigan State University Institute for Public Utilities, 40<sup>th</sup> Annual Regulatory Policy Conference, Williamsburg, VA (Dec. 10, 2008); George Mason University School of Public Policy (Feb. 12,

- 2009), Department of Economics, George Washington University (Apr. 23, 2009); Rutgers University Center for Research in Regulated Industries, 28<sup>th</sup> Eastern Conference in Advanced Regulatory Economics, Skytop, PA (May 14, 2009); Resources for the Future (June 11, 2009); Department of Economics and Finance, Curtin Graduate School of Business, Perth, WA, Australia (July, 23, 2009); Institute for Public Utilities Advanced Regulatory Studies Program, Michigan State University, East Lansing, MI (Oct. 1, 2009).
- “Optimal Energy Efficiency Policies and Regulatory Demand-Side Management Tests: How Well Do They Match?” Trans-Atlantic INFRADAY Conference on Applied Infrastructure Modeling and Policy Analysis, Washington, DC (Nov. 14, 2008); 7<sup>th</sup> International Industrial Organization Conference, Boston, MA (Apr. 4, 2009); Rutgers University Center for Research in Regulated Industries, 22<sup>nd</sup> Western Conference in Advanced Regulatory Economics, Monterey, CA (Jun. 19, 2009).
- “Antitrust and Deregulation in Software, Telecommunications, and Electricity: Current Directions and Opportunities,” *Electronics Evolution: Then, Now, Emerging*, 2008 ETA Educational & Leadership Conference, Electronic Technicians Association, French Lick, IN (Oct. 13, 2008).
- “Assessing Electricity Markets: (Slightly) Outside the (Economics) Box,” *Powering the Future: Key Energy Issues for the Next Administration*, Technology Policy Institute, Washington, DC (Sept. 26, 2008).
- “RPM as Exclusion: Did the U.S. Supreme Court Stumble Upon the Missing Theory of Harm?” Canadian Economics Association, Vancouver, British Columbia (Jun. 6, 2008); Southern Economic Association, Washington, DC (Nov. 21, 2008).
- “Exclusive Dealing, Tied Selling, and Bundling: An Economic Policy Assessment,” Canadian Competition Bureau, Gatineau, Quebec (May 23, 2008).
- “Night of the Living Dead? Electric Utility ‘Decoupling’ and the Resuscitation of Rate-of-Return Regulation,” 6<sup>th</sup> International Industrial Organization Conference, Arlington, VA (May 17, 2008).
- “Is the Benefit of Reserve Requirements in the ‘Reserve’ or the ‘Requirement?’” Rutgers University Center for Research in Regulated Industries, 27<sup>th</sup> Eastern Conference in Advanced Regulatory Economics, Skytop, PA (May 15, 2008).
- “Essential Facilities and *Trinko*: Should Antitrust and Regulation be Combined,” *The Enduring Lessons of the Breakup of AT&T: A Twenty-five Year Retrospective*, Center for Technology, Innovation, and Competition, University of Pennsylvania Law School, Philadelphia, PA (Apr. 18, 2008).
- “Electricity 101: Understanding Maryland’s Electricity Market,” Maryland Public Policy Institute, Annapolis, MD (Mar. 20, 2008).
- “How Are Texas Electricity Markets Regulated? Comments,” *Electricity Deregulation Texas-Style*, American Enterprise Institute, Washington, DC (Jan. 25, 2008).
- “Making a Molehill out of a Mountain: A (Very) Modest Net Neutrality Idea,” Phoenix Center for Advanced Legal and Economic Policy Studies, 2007 Annual U.S. Telecoms Symposium, Washington, DC (Nov. 28, 2007).
- “Should Innovation Rationalize Supra-Competitive Prices? A Skeptical Speculation,” *The Pros and Cons of High Prices*, Swedish Competition Authority, World Trade Centre, Stockholm, Sweden (Nov. 9, 2007); 6<sup>th</sup> International Industrial Organization Conference, Arlington, VA (May 18, 2008).
- “Electricity Policy Developments,” Paris School of Economics, Ecole Normale Supérieure, Paris, France, (Nov. 7, 2007); Swedish Competition Authority, Stockholm, Sweden (Nov. 8, 2007).
- “Can Antitrust Be Forward Looking?” *Grocery Store Antitrust: Historical Retrospective and Current Developments*, Bureau of Economics, Federal Trade Commission, Washington, DC (May 24, 2007).
- “Skating Toward Deregulation: Canadian Developments,” Rutgers University Center For Research in Regulated Industries, 26<sup>th</sup> Eastern Conference in Advanced Regulatory Economics, Skytop, PA (May 17, 2007).

- “Same Ends, Conflicting Means? Canadian Competition Law v. U.S. Antitrust,” Department of Public Policy, University of Maryland Baltimore County, Catonsville, MD (May 14, 2007).
- “Rational Attention in Deregulated Utilities,” Behavioral Economics and Consumer Policy Conference, Federal Trade Commission, Washington, DC (Apr. 20, 2007).
- “Tying and Intellectual Property: Comment,” Symposium on Intellectual Property and Competition Law, Competition Bureau and Canadian Intellectual Property Office, Ottawa, Ontario (Mar. 29, 2007).
- “Electricity Markets and Energy Security: Friends or Foes?” *Securing our Nation’s Future*, Georgetown Public Policy Institute Annual Conference, U.S. House of Representatives Rayburn Building, Washington, DC (Mar. 23, 2007).
- “Bundled Rebates as Exclusion, not Predation,” Strategy and Business Economics Division, Sauder School of Business, University of British Columbia, Vancouver, British Columbia (Dec. 8, 2006); 5<sup>th</sup> International Industrial Organization Conference, Savannah, GA (Apr. 14, 2007).
- “Information Sharing: Economics and Antitrust—Comment,” *The Pros and Cons of Information Sharing*, Swedish Competition Authority, World Trade Centre, Stockholm, Sweden (Nov. 10, 2006).
- “Exclusionary Conduct: Structuring an Approach to Abuse of Dominance,” Swedish Competition Authority, Stockholm, Sweden (Nov. 9, 2006).
- “Seeking a ‘Higher Energy’ State: Issues in Price Deregulation of Electricity,” *Competition Policy in Regulated Industries: Principles and Exceptions*, C. D. Howe Institute, Toronto, Ontario (Nov. 6, 2006).
- “S.79 Knots and Attempts to Untangle Them,” Canadian Competition Bureau, Civil Matters Branch Retreat, Ste. Adele, Quebec (Oct. 24, 2006).
- “Environmental Tools: Managing the Implementation Portfolio,” *Environmental Policy Tools Workshop*, Alberta Environment, Edmonton, Alberta, Canada (Oct. 4, 2006); Center for Urban Environmental Research and Education, University of Maryland Baltimore County, Baltimore, MD (Feb. 9, 2007).
- “2006 in Competition Policy and Enforcement: An Economic Perspective” (with Alan Gunderson), Economics and Law Committee, Canadian Bar Association, Annual Fall Conference on Competition Law, Gatineau, Quebec (Sep. 28, 2006); Vancouver Competition Policy Roundtable, Vancouver, British Columbia (Dec. 7, 2006).
- “Bundled Rebates: When Are They Anticompetitive and How Can We Tell?” eSapience Dinner and Discussion Series, Washington, DC (July 19<sup>th</sup>, 2006).
- “Fair Trade or Imperialism: Importing Merger Guidelines into Deregulatory Policy,” Centre for the Study of Government and Business, Canadian Economic Association, Montreal, Quebec (May 28, 2006); Rutgers University Center for Research in Regulated Industries, 19<sup>th</sup> Western Conference in Advanced Regulatory Economics, Monterey, CA (June 30, 2006).
- Statement, Predatory Buying Panel, Department of Justice Antitrust Division and Federal Trade Commission Joint Section 2 Hearings on Single-Firm Conduct, Washington, DC (June 22, 2006).
- “Exclusionary Conduct: Structuring an Approach to Monopolization Cases,” Commission for the Protection of Competition (COPROCOM) staff, Competition Bureau, Gatineau, Quebec (May 24, 2006); Office of Fair Trading, London, England (June 19, 2006).
- “Three ‘Mini’ Essays on Bundling,” Department of Economics, Carleton University, Ottawa, Ontario (Mar. 24, 2006); Department of Economics, University of Texas, Austin, TX (May 3, 2006); Bureau of Economics, Federal Trade Commission, Washington, DC (June 15, 2006).
- “*Trinko* v. Baxter: The Demise of *U.S. v. AT&T*,” Transportation and Public Utilities Group, American Economic Association, Boston, MA (Jan. 8, 2006); 4<sup>th</sup> International Industrial Organization Conference, Northeastern University, Boston, MA (Apr. 9, 2006).

## 2001 – 2005:

- “Competition Agency Roles: Complements or Substitutes?” Economics and Law Committee, Canadian Bar Association, Annual Fall Conference on Competition Law, Gatineau, Quebec (Nov. 3, 2005).
- “Public Use and ‘Just Compensation’: Observations on *Kelo v. New London*,” Resources for the Future, Washington, DC (July 20, 2005); Center for Urban Environmental Research and Education, University of Maryland Baltimore County, Catonsville, MD (Mar. 10, 2006).
- “Alleged Transmission Undersupply: Is Restructuring the Cure or the Cause?” Rutgers University Center for Research in Regulated Industries, 23<sup>rd</sup> Conference in Advanced Regulatory Economics, Skytop, PA (May 19, 2005); International Industrial Organization Conference, Northeastern University, Boston, MA (Apr. 8, 2006).
- “Consumer Preference Not to Choose: Methodological and Policy Implications,” Rutgers University Center For Research in Regulated Industries, 23<sup>rd</sup> Conference in Advanced Regulatory Economics, Skytop, PA (May 19, 2005), International Network for Economic Method, Allied Social Science Association Meetings, Boston, MA (Jan. 7, 2006).
- “Electric Energy Markets: Does the Market Send the ‘Right’ Prices?” 9<sup>th</sup> Annual Washington Energy Policy Conference, School of Advanced and International Studies, Johns Hopkins University, Washington, DC (Apr. 26, 2005).
- “Competition as an Entry Barrier? Consumer and Total Welfare Effects of Bundling,” 3<sup>rd</sup> International Industrial Organization Conference, Atlanta, GA (Apr. 8, 2005).
- “Saving Section 2: Applications” Competition Bureau, Industry Canada, Gatineau, Quebec (Oct. 15, 2004).
- “Saving Section 2: Theory” Competition Bureau, Industry Canada, Gatineau, Quebec (Oct. 14, 2004).
- “Saving Section 2: Provisional Observations,” Federal Trade Commission, Washington, DC (Jul. 13, 2004); School of Public Affairs, Baruch College, New York, NY (Mar. 3, 2005); Eastern Economic Association, New York, NY (Mar. 4, 2005); 3<sup>rd</sup> International Industrial Organization Conference, Atlanta, GA (Apr. 9, 2005); National Association of Attorneys General Antitrust Seminar, Denver, CO (Sep. 28, 2005).
- “Competition Policy Post-Privatization,” International Law Institute, Washington DC (Jun. 11, 2004, Oct. 14, 2005).
- “Flight of the Flamingo: Using Competition Law to Open Postal Markets,” 12<sup>th</sup> Conference on Postal and Delivery Economics, Center for Research in Regulated Industries, Rutgers University, Cork, Ireland (Jun. 4, 2004).
- “Pricing Issues in Electricity Generation and Local Telecommunications,” Declining Marginal Cost Industries in the Global Information Age, Competitive Enterprise Institute, Washington, DC (May 7, 2004).
- “Vertical Market Power’ as Oxymoron: Comments on Vertical Merger Guidelines,” George Mason Law Review 2004 Antitrust and Consumer Protection Symposium, Washington, DC (Mar. 2, 2004).
- “Implementing Electricity Policy,” Georgetown Public Policy Institute, Washington, DC (Nov. 22, 2003).
- “Regulation and Competition as Complements,” Center for Research in Regulated Industries, Rutgers University, Newark, NJ (Oct. 24, 2003); Rutgers University Center For Research in Regulated Industries, 23<sup>rd</sup> Conference in Advanced Regulatory Economics, Skytop, PA (May 19, 2004).
- “Electricity Markets: What Makes Them So Difficult?” National Economists Club, Washington, DC (Sep. 25, 2003).
- “Understanding Capacity Requirements,” Rutgers University Center For Research in Regulated Industries, 16<sup>th</sup> Western Conference in Advanced Regulatory Economics, San Diego, CA (June 27, 2003).

- “Fair Use as Policy Instrument,” Society for Economic Research on Copyright Issues, Annual Congress, Northampton, MA (June 19, 2003).
- “Mismeasuring Electricity Market Power: The Perils of Price-Cost Margins,” Rutgers University Center For Research in Regulated Industries, 22<sup>nd</sup> Conference in Advanced Regulatory Economics, Skytop, PA (May 21, 2003); School of Business, University of Alberta, Edmonton, Alberta (Oct. 10, 2003); International Industrial Organization Society Conference, Chicago, IL (Apr. 24, 2004); Economic Analysis Group, Antitrust Division, U.S. Department of Justice, Washington, DC (May 4, 2004).
- Panelist, “U.S. v. Microsoft, Where Do We Go From Here?” International Industrial Organization Society Conference, Boston, MA (Apr. 5, 2003).
- “Inherently Inalienable: The Normative Role of Rights in Social Policy,” Association for Social Economics, New York, NY (Feb. 22, 2003).
- “Political Economy and the Efficiency of Compensation for Regulatory Takings,” Eastern Economic Association, New York, NY (Feb. 21, 2003); Association for Public Policy Analysis and Management, Washington, DC (Nov. 8, 2003); Department of Economics, University of Auckland, Auckland, NZ (Mar. 21, 2005).
- “State and Federal Roles in Facilitating Retail Electricity Competition,” Regional Transmission Organizations: Restructuring Electricity Transmission, Van Horne Institute, Center for Regulatory Affairs and Canadian Institute of Resources Law, University of Calgary, Calgary, Alberta (Sep. 27, 2002).
- “Opening Electricity Markets: Lessons from the U.S. Experience,” Symposium on Power Trading and the Role of Government, Deutsche Hochschule für Verwaltungswissenschaften Speyer (German University of Administrative Sciences-Speyer), Speyer, Germany (Jun. 25, 2002); Institute for Policy Studies, Johns Hopkins University (Oct. 7, 2002).
- “Market Failures in Real-Time Metering: A Theoretical Look,” Rutgers University Center For Research in Regulated Industries, 15<sup>th</sup> Western Conference in Advanced Regulatory Economics, South Lake Tahoe, CA (June 20, 2002).
- “Challenges in Deregulating Electricity: Drawing the Right Lessons from California,” EPCOR Distinguished Lecture, Center for Applied Business Research in Energy and the Environment, School of Business, University of Alberta, Edmonton, Alberta (Oct. 4, 2001); Department of Economics and Faculty of Social Science, University of Calgary, Calgary, Alberta (Mar. 1, 2002); Symposium: Is Government Zapping Our Energy? William-Smith Lectures on Private Enterprise and Democracy, Oberlin College, Oberlin, OH (Mar. 9, 2002); Annual Energy Outlook/National Energy Modeling System Conference, Energy Information Administration, U.S. Department of Energy, Crystal City, VA (Mar. 12, 2002); Nitze School of Advanced International Studies, Johns Hopkins University, Washington, DC (Mar. 13, 2002).
- “‘Vertical Market Power’ As Oxymoron: Getting Convergence Mergers Right,” Rutgers University Center for Research in Regulated Industries, 14<sup>th</sup> Western Conference in Advanced Regulatory Economics, San Diego, CA (June 28, 2001).
- “To Squeeze or Not To Squeeze: Why Put Vertical Claims Into Horizontal Boxes,” for panel on “Raising Rivals’ Costs: Should the Government Be Concerned?” Association for the Bar of the City of New York, New York, NY (Apr. 19, 2001); Competition Bureau, Industry Canada, Hull, Quebec (Dec. 6, 2001).
- “Correcting Abuses of Dominance: Controlling Conduct and Altering Structure,” principal speaker, “Symposium: Pyrrhic Victories: Reexamining the Effectiveness of Antitrust Remedies,” George Washington University School of Law, Washington, DC (Mar. 23, 2001).
- “U.S. Electricity Competition, 2000-01: Background and Lessons,” Efficiency and Fairness in the Competitive Economy, Mansfield Center for Pacific Affairs, Washington, DC (Mar. 19, 2001); Learning in Re-

tirement Institute, George Mason University, Fairfax, VA (Apr. 24, 2001), U.S.-Asia Environmental Partnership, Washington, DC (Sep. 26, 2001).

“The California Electricity Experience, 2000-01: Education or Diversion?” McGee Lecture in Public Policy, Owen School of Business, Vanderbilt University, Nashville, TN (Mar. 1, 2001); Rutgers University Center For Research in Regulated Industries, 20<sup>th</sup> Annual Conference in Advanced Regulatory Economics, Tamiment, PA (May 24, 2001).

“Implementing Electricity Competition: What Can We Learn From California?” School of Public Affairs, Baruch College, New York, NY (Feb. 9, 2001).

#### 1996 – 2000:

“Economists, Economics, and Jurisprudence: Notes on *Browner v. American Trucking Association*,” Resources for the Future, Washington, DC (Nov. 28, 2000).

“Traditional Policy Analysis and the New Economy,” Association for Public Policy Analysis and Management, Seattle, WA (Nov. 2, 2000).

“Implementing Electricity Restructuring: Background, Issues, Controversies, and Assessment,” Department of Energy, Environmental, and Mineral Economics, Penn State University, University Park, PA (Oct. 27, 2000).

“Convergence Mergers as Horizontal Mergers: Why and How,” Department of Energy, Energy Information Administration, Washington DC (Oct. 24, 2000).

“Policy Federalism and Regulating Broadband Internet Access,” Rutgers University Center For Research in Regulated Industries, 13<sup>th</sup> Western Conference, Monterey, CA (July 7, 2000); International Communications Forecasting Conference, Seattle, WA (Sep. 28, 2000).

“Green Preferences as Environmental Policy,” Rutgers University Center for Research in Regulated Industries, 19<sup>th</sup> Eastern Conference, Bolton Landing, NY (May 25, 2000); Eastern Economic Association, New York, NY (Mar. 4, 2005).

“Do Easy Cases Make Bad Law? Antitrust Innovation or Missed Opportunities in *U.S. v. Microsoft*,” Northwestern University, Evanston, IL (Mar. 9, 2000); University of Maryland Baltimore County (April 18, 2000); Energy Information Administration, U.S. Department of Energy, Washington, DC (May 9, 2000); Economists, Inc., Washington, DC (July 25, 2000); International Association of Energy Economists, Library of Congress, Washington, DC (Sep. 15, 2000); Federal Communications Commission, Washington, DC (Oct. 4, 2000); Public Policy Workshop, George Washington University, Washington, DC (Oct. 18, 2000); Resources for the Future, Washington, DC (Feb. 7, 2001); American Bar Association Antitrust Section, Economics and Computer Industry Committees, Washington, DC (Feb. 21, 2001); Department of Economics, Vanderbilt University, Nashville, TN (Mar. 2, 2001); Department of Economics, West Virginia University, Morgantown, WV (Apr. 6, 2001); Learning in Retirement Institute, George Mason University, Fairfax, VA (Sep. 25, 2001); School of Business, University of Alberta, Edmonton, Alberta (Oct. 5, 2001); School of Public Affairs, Baruch College, New York, NY (Nov. 9, 2001); Competition Bureau, Industry Canada, Hull, Quebec (Dec. 7, 2001).

“Implementing Electricity Competition: Policy Problems to Solve,” Efficiency and Fairness in the Competitive Economy Program, Mansfield Center for Pacific Affairs, Brookings Institution, Washington, DC (Mar. 7, 2000), Bonneville Power Administration Washington Program, Resources for the Future, Washington DC (Jun. 19, 2000).

“Antitrust Policy: Theoretical Advances and Policy Cycles,” World Bank, Washington, DC (Nov. 17, 1999).

“Price Regulation and Privatization: The Case of Chile,” World Bank, Washington, DC (Nov. 12, 1999).

“Price Regulation: Received Insights and Recent Advances,” World Bank, Washington, DC (Nov. 12, 1999)

- “Why is Electricity Competition So Thorny?” George Mason University (Oct. 25, 1999); Resources for the Future, Washington, DC (July 28, 1999).
- “Updating *A Shock To The System*: New Developments in Electricity Restructuring,” Energy Information Administration, Department of Energy, Washington, DC (July 13, 1999); Resources for the Future, Washington, DC (May 10, 1999).
- “Do Lower Prices for Polluting Goods Make Environmental Externalities Worse?” Rutgers University Center for Research in Regulated Industries, 12<sup>th</sup> Western Conference, San Diego, CA (July 8, 1999).
- “Current Controversies: The Who, What, When and Why of Electricity Restructuring,” Middle Tennessee State University, Electricity Deregulation Symposium, Murfreesboro, TN (Mar. 30, 1999).
- “Vertical Excuses for Horizontal Practices: Should There Be Any *Per Se* Antitrust Rules?” American Economic Association Meetings, New York, NY (Jan. 5, 1999).
- “Deregulatory Policy in Telecommunications: Quandary or Oxymoron?” Cato Institute, Washington, DC (Nov. 5, 1998).
- “Promoting Telephone Competition: A Simpler Way?” School of Public Affairs, Baruch College, CUNY, New York, NY (Feb. 8, 1999); Center for the Study of Public Choice, George Mason University, Fairfax, VA (Nov. 10, 1998), Federal Communications Commission, Washington, DC (Nov. 4, 1998), 26<sup>th</sup> Telecommunications Policy Research Conference, Alexandria, VA (Oct. 4, 1998).
- “Critical Issues in Electricity Restructuring: Lessons and Policy Implications of Emerging Markets in New England and Elsewhere,” Alliance for Competitive Electricity, U.S. Capitol, Washington, DC (July 27, 1998).
- “Demand-Side Management Programs Under Retail Electricity Competition,” World Bank, Private Participation in Infrastructure Group, Washington, DC (Mar. 25, 1999); Department of Energy, Electricity Working Group, Washington, DC (Mar. 16, 1999); University of California Energy Institute, POWER Conference, Berkeley, CA (Mar. 5, 1999), Rutgers University Center For Research in Regulated Industries, 11<sup>th</sup> Western Conference, Monterey, CA (July 10, 1998).
- “Privatization Scenarios and Policy Issues,” Helium Reserve Committee, National Research Council, Washington, DC (July 6, 1998).
- “Looking Forward: The FCC and the Information Economy,” (panelist with FCC Commissioner H. Furchtgott-Roth and P. Pitsch), Session Eight of *Regulation: Principles, Practice, and Opportunities for Reform*, George Mason University, Longworth House Office Building, Washington, DC (Jun. 19, 1998). Transcript available at <http://www.gmu.edu/jbc>.
- “The Clinton Administration’s Competitive Electricity Competition Plan,” University of Calgary, Calgary, Alberta, Canada (May 8, 1998).
- “Electricity: The Big Policy Shifts,” Knight Center for Specialized Journalism, University of Maryland, College Park, MD (Feb. 16, 1998).
- “Executive Branch Electricity Policy Issues,” Resources for the Future, Washington, DC (Oct. 30, 1997).
- “Lessons of Governance Learned at the Council of Economic Advisers,” Department of Economics, University of Calgary, Calgary, Alberta, Canada (May 8, 1998); Center for Public Choice, George Mason University, Fairfax, VA (Oct. 28, 1997); Department of Economics, University of Maryland Baltimore County, Catonsville, MD (Oct. 6, 1997).
- “Antitrust and Regulation: The Interface in U.S. Telecommunications,” International Telecommunications Society, Calgary, Alberta (Jun. 16, 1997).
- “The Stranded Cost Debate in U.S. Electricity Deregulation,” Van Horne Institute, Calgary, Alberta (Jun. 13, 1997).



- “Electricity Restructuring and the U.S. Antitrust Laws,” TransAlta Corporation, Calgary, Alberta (Jun. 13, 1997).
- “Innovation Data for Public Policy,” National Research Council Workshop on Industrial Research and Innovation Indicators for Public Policy, National Academy of Sciences, Washington, DC (Feb. 28, 1997).
- “RBOC Entry into Long Distance Markets: Questions to Resolve,” Federal Communications Commission, Washington, DC (July 23, 1996).
- “A Philosophical Assessment of ‘Law and Economics’: Policy Norms and Judicial Contexts,” Fünftes Travemünder Symposium zur Ökonomischen Analyse des Rechts, Travemünde, Germany (Mar. 30, 1996).
- “The Information Infrastructure Task Force White Paper: An Economic Perspective,” Conference on Property and Commons in the Age of Information, Virginia Polytechnic Institute, Blacksburg, VA (Mar. 16, 1996).
- “Technology and Coordination: Antitrust Implications of Remote Sensing Satellites,” Symposium: High Technology, Antitrust, and the Regulation of Competition, Harvard Law School, Cambridge, MA (Mar. 9, 1996).
- 1990 – 1995:**
- “Regulated Firms in Unregulated Markets,” before Canadian Senate Standing Committee on Transport and Communications, Washington, DC (Nov. 15, 1995).
- “What’s ‘New’ In Industrial Organization?” U.S. Agency for International Development, Annapolis, MD (Sep. 14, 1995).
- “ACCORD: An Internet Testbed Community for Coordinating Digital Technology and Academic Resource Development” (with Mary Keeler), Interoperability and the Economics of Information Infrastructure Workshop, Freedom Forum, Rosslyn, VA (Jul. 6, 1995).
- “Compensation for Regulation: Efficiency, Political Economy, and Equity in the Law,” (with James Boyd), 11<sup>th</sup> Annual AERE Workshop, Annapolis, MD (Jun. 5, 1995); Center for Public Choice, George Mason University (Sept. 26, 1995); Department of Economics, Louisiana State University (Nov. 3, 1995).
- “From Here to Eternity or Gone With the Wind: Does the Theory Behind U.S. v. AT&T Still Apply today?” 14<sup>th</sup> Annual Eastern Workshop in Advanced Regulatory Economics, Newport, RI (May 26, 1995); Association for Education in Journalism and Mass Communications, Washington, DC (Aug. 9, 1995); Telecommunications Policy Research Conference, Solomon’s Island, MD (Oct. 1, 1995); Industry Canada-Competition Bureau, Aylmer, Quebec (Nov. 17, 1995); Federal Communications Commission, Office of General Counsel-Competition Division (Nov. 29, 1995).
- “Stranded Assets,” Resources for the Future Council, Carmel, CA (Apr. 6, 1995).
- “Market Failure and Policy Failure,” Office of Technology Assessment, Washington, DC (Feb. 15, 1995).
- “The Economics of Regulation” and “U.S. v. AT&T,” Institutional Reform and the Informal Sector presentation to a delegation from the Russian Duma and State Committee for Anti-Monopoly Policy, Washington, DC (Sept. 1-2, 1994, Oct. 7, 1994).
- “Game Theory and the First Amendment: Strategic Implications of Freedom of the Press,” Joan Shorenstein Barone Center on the Press, Politics and Public Policy, John F. Kennedy School of Government, Harvard University, Cambridge, MA (Mar. 14, 1994); Telecommunications Policy Research Conference, Solomon’s Island, MD (Oct. 2, 1994).
- “Is Cost-of-Service Regulation Worth the Cost?,” 13<sup>th</sup> Annual Rutgers University Conference/Advanced Workshop in Regulation and Public Utility Economics, Newport, RI (May 25, 1994).

- “Two Kinds of Commensurability,” American Economic Association/Association for Social Economics, Boston, MA (Jan. 3, 1994).
- “Market Competition: An Economic Analysis,” *RBOC Regulatory Relief: Strategic Positioning for the Inevitable*, Telestrategies, Inc., Rosslyn, VA (Sept. 2, 1993).
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